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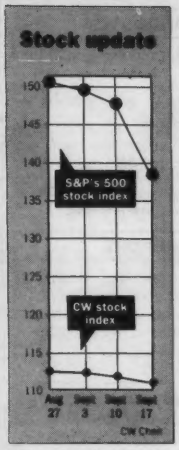

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Alpha Microsystems rebuffs Point 4 Data with white-knight Televideo Systems. **Page 146.**

■

At the National Retail Merchants Association conference tomorrow, Tandem Computers, Inc. will announce a point-of-sale network controller. Store Link combines Tandem's processors with software modules from two independent vendors. First-user Ross Stores, Inc., of Newark, Calif., has cut the time involved in formatting sales transaction data it receives electronically from its store cash registers by a factor of six, according to Peter Hart, the company's MIS vice-president.

■

The software bundling suit that Data General recently settled with Fairchild Semiconductor [CW, Sept. 15] has

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Coming this week:

EXTRA!

The world of Digital Equipment Corp. — from R&D to new products, from user strategies to third-party software — will be featured in *Extra* magazine, due out Sept. 24. The issue will include reports on Microvax, Vaxmate and next-generation VAXs, plus provocative interviews with executives past and present.

IBM unveils new net plan

Multivendor devices, PBXs and Token-Ring tie to SNA

By Stanley Gibson

RYE BROOK, N.Y. — Attempting to steal a march in the computer industry's connectivity battle, IBM last week announced products designed to allow large users to centrally manage corporatewide networks.

Although many of the products will not be available until late 1987, IBM said it will provide the ability to tie non-IBM computer equipment and private branch exchanges as well as its own Token-Ring network into a Systems Network Architecture network management system.

Managers will be able to monitor departmental networks using a Personal Computer version of IBM's mainframe-based Netview program, announced in May. Operating on IBM Personal Computer XTs or ATs, Netview/PC communicates with Netview on IBM 370 mainframes to provide workstation control and monitoring of extensive networks.

"We see a very significant customer requirement to manage multivendor networks," said Bill Warner, director of business systems management at IBM's communications programming lab in Raleigh, N.C. "We're trying to open up our network management system and provide applications and a way for other manufacturers to bring their equipment into the system."

Warner would not specify the number of nodes that might be supported by one Netview/PC, except to say that a single PC can monitor up to 10 Rolm Corp. Computerized Branch Exchanges and Rolm CBX II 9000 nodes.

As a first step in implementing its con-

See **IBM** page 4

Big users get Apple loaners

By Peggy Watt

CUPERTINO, Calif. — Apple Computer, Inc. last week confirmed it will launch yet another assault on the large corporate market, inviting microcomputer managers to take a number of leading Apple products on extended loan.

The program, to begin next month, includes the loan of the Macintosh Plus, the Apple Laserwriter printer and such popular third-party Macintosh products as Microsoft Corp.'s Excel integrated software package.

The loan program will be handled by Apple's 18 regional business development managers, who will contact and invite Fortune 1,000 corporations to participate.

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Micro drive into departmental DP keys ADR strategy

By Charles Babcock

NASHVILLE — Applied Data Research, Inc., reflecting the research and development muscle of its new owner, Ameritech, last week announced a strategy of developing local-area network and personal computer versions of its mainframe system products.

Underscoring the strategy behind the move, Joseph W. Farrelly, ADR vice-president of research and development, told 1,300 attendees at the company's annual users group meeting here that ADR believes networked PCs, rather than minicomputers, will become the focus of tradi-

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CW SPECIAL REPORT

Capacity plan: Ocean Spray MIS prepares to meet 1990

By James Connolly

PLYMOUTH, Mass. — The view from the MIS department extends from the Pilgrims' 1620 landing place across sand dunes to a bluefish-filled harbor.

The setting tells the casual observer that Ocean Spray Cranberry, Inc. is a tiny regional juice bottler hiding in a quiet New England tourist town where storms spatter sea water on office windows. Ocean Spray's contemporary-style offices — complete with exposed wood beams — seem to support the misconception that the company does not belong in the button-down ranks of big business.

Exposed beams even show up in place of the normal suspended ceilings in the computer room, where an IBM 3083 Model EX sits just eight feet above Plymouth Harbor's high-water mark.

Ocean Spray once was but is no longer a "sleepy little regional company." It has gone national, which means its MIS department has to cope with and plan for steady growth and the changing nature of the firm's business, reports MIS director Thomas Modestino. Growth has meant moving up from a Burroughs Corp. minicomputer to the IBM 3090 that Ocean Spray has on order.

Modestino

The company's projected MIS strategy includes the installation next May of a 3090 Model 150 and periodic updates of a capacity-planning model that Modestino uses to forecast CPU requirements for major applications on a six-month basis through 1990. In addition, the company has gone from a centralized strategy to a decentralized one and back again to centralization.

In five years, Ocean Spray has added and expanded an information center to support personal computers, electronic order and bill processing, manufacturing software and a mainframe-based decision support system.

All of these moves are intended to support the company's revenue growth while keeping its employment

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NEWSPAPER

Installing the first Model 400

Nielsen's 3090 upgrade was 'smooth,' users say

By Jean S. Bozman

GREEN BAY, Wis. — The first installation of an IBM 3090 Model 400 went flawlessly, according to the MIS staff at the Nielsen Marketing Research division of A. C. Nielsen Co. that participated in it. In fact, said Rick O'Hara, manager of computer services, "the whole thing went smooth as ice."

The installation, which took place at the end of August, was a $4.1 million field upgrade from the company's 3090 Model 200. It took 19 hours to complete — not counting the 12 hours of site preparation required before the installation began.

When IBM offered to make Nielsen's Green Bay research center the first commercial site for the Model 400, MIS managers were a bit surprised. They had not expected the upgrade until Oct. 1 at the earliest and Nov. 26 at the latest.

But they were anticipating the extra capacity the Model 400 would bring because their work — sorting sales data from 1,600 supermarkets in 26 major markets nationwide — is CPU-intensive, demanding a lot of machine cycles.

Analyzing data from 2,800 stores

Plans for growth were also dependent on the upgrade, because Nielsen wants to analyze data from 2,800 stores in 35 major markets during 1987. The Green Bay site, which generates tens of thousands of market reports annually, is one of five Nielsen Marketing Research computer operations around the country.

The others are a Florida computer operation for the company's famed television rating service, a Minneapolis computer room that supports an on-line market research data base and two more computer centers in Fond du Lac, Wis., and Lincoln, Neb.

Following an August meeting at IBM that approved general availability by this month, IBM offered to move up the installation date; Nielsen jumped at the chance.

"We were running at a constant 98% or more of capacity," O'Hara said. "When you're running at that level, you're afraid you're going to fall behind in your work load if anything brings the system down."

Preparatory work

Initial preparation for the upgrade began during the summer, when additional electrical work had to be done to Nielsen's 9,500-sq-ft computer room to accommodate the extra power demands of the Model 400 upgrade, which was configured with 128M bytes and 64 channels.

The actual installation involved bolting two Model 200 CPU units together, adding two more 3097 water cooling units and two more 3089 motor generator units to provide "clean" power.

There was software preparation involved as well. Nielsen systems engineers had to plan on running the same copy of MVS/XA Version 2 Release 1.7 on both CPUs. That was because Nielsen planned to run the Model 400's four CPUs in a single-image mode.

There is only one copy of the MVS/XA operating system, and the four CPUs act as a single virtual computing system. In addition, some microcode on the Model 200 had to be upgraded to match that of the Model 400.

IBM truck arrives

At noon on Aug. 22, an IBM truck pulled into Nielsen's parking lot with the hardware, which took several hours to uncrate. The afternoon was spent positioning the Model 400 upgrade next to the Model 200 so that the new computing complex was in an "H" formation.

At 11 p.m., IBM's staff of 10 took a break for the night. "There was a lot of fine wiring on the back panels that had to be done," said Doug Bowhousen, manager of technical services at Nielsen, "and they wanted to be sure those guys were well rested before they began to work."

The IBM staff members selected to do the wiring had practiced on several IBM in-house installations of the Model 400 as well as on several beta sites at IBM customer locations. One of their most important tasks was hard-wiring the processor controller to all four CPUs.

Also on hand was a parts expert who was prepared to locate a replacement for any missing or faulty part and to have it flown in within hours.

IBM supervisors

Several IBM supervisors observed the job from start to finish, taking notes on the installation process. "They wanted to learn a lot from our installation and to refine the process for the next install," O'Hara said.

At 6 a.m. the next day, a Saturday, the Model 200 was powered down, allowing the IBM installation team to wire the two halves of the four-CPU machine together. Until then, the Model 200 had been running production work.

During the installation, there was only one way to move: forward. "An all-out back-out was out of the question," said Dan Berg, senior systems programmer. "There were no attractive alternatives."

Within eight hours, the Model 400 was ready to be powered up and tested; at 10 p.m., IBM turned the machine over to the Nielsen MIS team. After three hours of software testing, the machine was deemed ready to resume production jobs.

In all, Nielsen's operation was closed down for 19 hours, while the total installation took 38 hours including the overnight break.

Now that Nielsen has the extra capacity, it plans to protect it with a new 750 kVA uninterruptible power supply built by Emerson Electric Co. that will provide 15 minutes of power before a diesel generator is turned on.

Further expansion, including the addition of more IBM or IBM-compatible computers, is possible, O'Hara said. But for now, he added, he just wants to keep everything up and running. "When you're running as many jobs as we do," he said, "you never can get back the time you lose."

Bozman is a Computerworld *contributor based in Chicago.*

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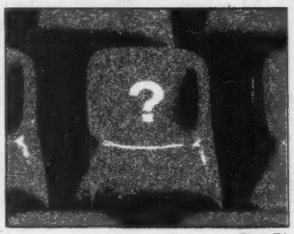

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Tandem first with high-level Cobol 85

By Jeffry Beeler

CUPERTINO, Calif. — Tandem Computers, Inc. last week became the first vendor to announce high-level compliance with the Cobol 85 standard adopted by the American National Standards Institute (ANSI).

At the London-based National Computing Centre Ltd., Tandem's Cobol 85 compiler successfully completed all 300-plus tests that prove full compliance to the ANSI standard, according to Tandem spokesmen.

Tandem's claims were later substantiated by Kate Ainsworth, one of the London computing center's validation specialists who helped conduct the high-level certification tests for the U.S. company's compiler.

High-level compliance certification

The National Computing Center, an independent testing agency that also provides training and consulting services, works under contract with the U.S. General Services Administration (GSA). The center is reportedly the only organization authorized to certify compilers for high-level compliance.

Other companies, including Micro Focus, Inc. and Ryan-McFarland Corp., recently reported GSA test results that certify their compilers as conforming to the standard's intermediate-level specifications.

By having a compiler that meets all the requirements of the current ANSI Cobol 85 standard, users gain "Cobol's full functionality rather than just a subset of its features," according to Corinne Robinson, Tandem's software product manager.

In its full implementation, ANSI Cobol 85 supports program statements, functions and labor-saving conveniences that less complete versions of the language lack.

The presence of such features eases software development and improves programmer productivity, Robinson said.

Although Robinson was unable to quantify the productivity improvements, one of Tandem's Cobol 85 beta-test users credited the full implementation for greatly accelerating two of his development projects.

Eyring Research, Inc., a Salt Lake City-based developer of custom software, has used the Tandem product internally to create a nationwide message switch for law enforcement authorities in Kansas City, Kan. The same compiler, which became generally available last May, has also helped Eyring produce an automated dispatch system for police in Riverside County, Calif.

Unlike its ANSI 74 standard predecessor, which the Utah company has also used, Cobol 85 supports revised data structures and allows programs to be written with nested IF statements. Tandem's high-level implementation of the latest ANSI Cobol standard also supports external storage and external statements, according to Rich Bellis, an Eyring project manager.

Together, these and other added features render the language well suited to structured programming; thus, they simplify software maintenance. They also promote the creation of reusable program modules, Bellis said.

IBM unveils net strategy

From page 1

nectivity scheme, IBM announced several network management application packages that run with its new Netview/PC product and mainframe-based Netview. The programs work with Rolm's CBX and other PBX equipment, tying voice communications into an SNA network for the first time.

IBM also announced an application programming interface (API) that will allow users and other vendors to develop software connecting their equipment to an SNA network. IBM said it will publish the API specifications and will provide education on the company's communications architectures to software developers.

"The network management standard is really API," said communications consultant and analyst Dixon Doll, president of the DMW Group, Inc. of Ann Arbor, Mich. Doll, who consulted with IBM on the concept's development, explained that the development software is at the heart of IBM's announcement because it is the means by which non-IBM equipment can enter an IBM network.

"The controversy is that standards are being put on the table. Almost all non-IBM vendors will have to decide whether to play or not. Users will have to decide also," Doll said.

Doll predicted that numerous vendors will take up IBM's invitation to use API to design applications, although major rivals such as Digital Equipment Corp. and AT&T will probably remain on the sidelines for the near future.

Other analysts said the IBM products could significantly impact the market for departmental systems.

"People won't defect from DEC, but it may make people think twice about defecting from IBM, particularly in the mid-range," said Patrick Gordon, a senior analyst with the Yankee Group.

"Someone will write an API program for Decnet," Gordon predicted. "Vendors who want to play in an IBM

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Rollouts key PBX-SNA tie

By Stanley Gibson

Among the first products in IBM's Netview network management fold are three host programs and two Rolm Corp.-developed Personal Computer programs that will bring private branch exchange equipment into a Systems Network Architecture (SNA) network. Designed to work together, all the products will be available in the third quarter of 1987.

The IBM 370 host programs include the following:

- Netview Network Billing system, which provides the customer with an accounting of Rolm's Computerized Branch Exchange (CBX) costs and usage by departments, long-distance carriers and equipment for a monthly charge of $1,585.
- Netview Traffic Engineering Line Optimization System, a set of five programs that allows users to analyze call detail records received from the Rolm Call Detail Collector program in order to determine cost-effective ways of configuring a site's telecommunications system, for a monthly charge of $1,900.
- Netview Tariff Data base, which provides U.S. long-distance carrier tariff information for use with the Billing System and Traffic Engineering Line Optimization System programs for $2,000 per month.

The two Rolm-developed packages include the following:

- The Rolm Alert Monitor Program notifies network operators of problems in a CBX or network of CBXs.

If a voice communication line is not working, the Alert Monitor will cause Netview/PC to display an alert message. Information on the problem can be sent from the PC to the Netview host program, which displays the status of all CBXs on the network. The package costs $6,500.

- The Rolm Call Detail Collector

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IBM unveils net strategy

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environment will have to support it. But it is going to be awkward for Data General Corp. and DEC to say, 'We support Netview,' " he said.

Francis McInerney, senior analyst with Northern Business Information, Inc., said the connectivity announcement signals a major change in direction for IBM.

"It's the beginning of a new strategy at IBM. IBM will force its lines of business to meet more rigorous product specifications. It presages a consolidation of architectures that will lead eventually to a single architecture."

According to IBM's Warner, seven companies have announced they will support IBM's open communications architecture by using API to develop programs. The firms and their products are the following:

- Network Equipment Technologies Co. of Redwood City, Calif., announced a package that will allow a user to manage the firm's IDNX network along with an SNA network from a single point.
- Timeplex, Inc. of Woodcliff Lake, N.J., announced Link/View, which adapts its Link/1 and Link/2 T1 resource managers to Netview.
- The DMW Group's software products division will adapt its PBX Data Management System to send diagnostic information to Netview.
- Other vendors are Datatel, Inc., Teleprocessing Products, Inc., Doelz Networks, Inc. and Industrial Networking, Inc.

Netview/PC and and the Netview interfaces offered by other vendors will be available in 1987. Netview/PC carries a onetime charge of $2,000, IBM said.

In addition, IBM announced the following programs:

- The Token-Ring Network Manager Version 1.1, a version of IBM's previously announced network management program for the IBM Token-Ring network that will work with Netview/PC and host-based Netview.

The PC-based program can send information to a remote mainframe, where a central network manager can monitor a remote Token-Ring network. It carries a onetime charge of $1,495 or an upgrade charge of $75.

- Separately announced, the IBM 3270 Personal Computer and 3270 Personal Computer AT can attach to the Token-Ring network using the previously announced IBM Token-Ring network PC Adapter II cards and the IBM Token-Ring network Netbios program Version 1.1, which was also announced last week. Token-Ring Netbios Version 1.1 is priced at $35.
- The IBM Token-Ring Starter Kit includes adapters, cables, network software, interactive installation diskettes and instructions for assembling a four-station, Token-Ring network. The kit costs $4,574.

Rollouts key PBX-SNA tie

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collects telephone call information from up to 10 CBXs or PBXs of other vendors. Netview/PC can transfer this information to the three new host programs to perform billing, configuration planning and network analysis.

Data can be sent to an IBM host using Netview/PC's file transfer facilities, which is LU6.2, or to a non-SNA network or a non-IBM host via a 3780 remote job-entry link. It costs $6,500.

Rolm also announced that it will sell and support a pollable storage device called Call Collector 3 (CC3) to work with the Call Detail Collector. CC3 is manufactured by SB International, Inc., of Toronto. According to Rolm, CC3 is an intelligent, pollable storage hardware device with a capacity of 50,000 call records. CC3 prices range from $3,000 to $6,500.

IBM unwraps entry-level 3480

By James Connolly

RYE BROOK, N.Y. — IBM last week took the first step in what analysts have long expected would be an attempt to move its 3480 cartridge tape drive technology into smaller systems markets.

The company introduced an entry-level 3480 system that offers a slower data transfer rate and less expandability in exchange for a lower price than the high-end, mainframe-oriented 3480 model introduced in March 1984. The subsystem consists of the A11 control unit and the B11 magnetic tape unit.

Both the 11 and 22 versions use ½-in., 18-track magnetic tape with a recording density of 38,000 byte/in. However, the 11 products feature a data rate of 1.5M byte/sec., compared with 3M byte/sec. for the original products.

In addition to having the slower data transfer rate, the new tape system does not allow customers to string multiple 3480s together without the purchase of a $4,045 coupler and a $5,000 dual control unit communication feature. Standard features in the original models allowed the linking of up to 16 3480s.

The A11 costs $49,080, and the B11 costs $38,810. By comparison, the A22 costs $65,430, and the B22 costs $43,120. The A11 and B11 will be available generally during the first quarter of 1987.

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IBM shores up RT with storage, communications features

Revamp said to trail Apollo, Sun terminals

By Rosemary Hamilton

RYE BROOK, N.Y. — IBM last week revamped its RT Personal Computer, which has reportedly been a major disappointment in the workstation market since its introduction nine months ago.

With the announcement, IBM addressed three areas that were considered drawbacks to the RT PC — pricing, communications capabilities and storage capacity, industry analysts say. As a result, the RT has been improved, they say, but not to the point where it will be a serious threat to other workstation offerings.

Frank King, general manager of advanced engineering systems at IBM's industry systems business product unit, would not directly respond to criticism of the RT. According to King, the number of value-added resellers, which now totals 66, and third-party software developers are "better indicators of the acceptance of the product.

"We're very pleased with how the RT is doing," King added. "We're going to continue to make the RT better and better and broader and broader over time."

Included in the announcement was the RT PC 6151 Model 15, which starts at $10,050 and comes with 2M bytes of main memory and 70M bytes of disk storage, approximately double the standard main memory and storage of the current RT models. It is scheduled for shipment in October.

IBM cut prices by 20% to 32% on the current line, bringing the starting price of the RT line down to $7,900. The vendor also introduced a version of the AIX operating system and cut its price by more than $1,000.

"The RT has gone from awful to mediocre," said Robert Herwick, a senior analyst at Hambrecht & Quist. "It was obvious that the original announcement was extremely deficient," he said, referring to the RT's debut in January. "They have apparently fixed the worst parts."

With a series of hardware options, upgrades to existing RT software and new software programs, IBM significantly beefed up storage capacity and communications capabilities.

However, the announcements did not specifically address graphics performance. Engineers require and expect graphics performance, and IBM needs to improve the RT's graphics capabilities if it is to compete with Apollo Computer, Inc. or Sun Microsystems, Inc. systems, said Vicki Brown, a senior analyst at International Data Corp. in Framingham, Mass.

"The one major obstacle now is graphics performance," Brown said. "I guess they are taking it one step at a time." According to Brown, an RT user requiring a high-resolution color display with three-dimensional capabilities would need to purchase a model in the IBM 5080 display station line, which has a starting price of $13,000. The other workstation vendors offer high-resolution color monitors bundled in their systems.

But IBM's King maintains that an RT with a 5080 monitor, which would cost between $25,000 and $30,000, is price-competitive with the high-resolution, 3-D offerings from other workstation vendors.

The new AIX release, which has a one-time charge of $2,295 and will be available in March of next year, can support up to 16 users concurrently.

It includes System Network Architecture capabilities to support the LU1, LU2, LU3 or LU6.2 protocols over a Synchronous Data Link Control connection. The LU6.2 protocol can support a connection to an Ethernet-based local-area network as well as improve the RT's ability to communicate with other IBM systems.

Hardware options include the following:

- A 4M-byte memory expansion card that sells for $4,300 and will be available this month.
- An improved floating-point accelerator card, priced at $1,995 and scheduled for release in the second quarter of 1987.
- A small computer systems interface adapter card, which would allow the attachment of up to seven of the recently announced IBM 9332 direct access storage device. The $1,080 card will be available in the second quarter of 1987.
- A 370 host interface adapter, which provides a link to transfer data between the RT PC and a 370 host at a speed of 2M bit/sec., IBM spokesmen said. Scheduled for release in March, it will sell for $1,795.

IBM's software announcements included releases of the RT Virtual Resource Manager, which will sell for $895, and SQL/RT Data Base, which can be licensed for $1,000.

Oracle intros target distributed data base management

By Charles Babcock

BELMONT, Calif. — Oracle Corp., one of the fastest growing data base management system vendors, today is expected to launch a suite of products addressing the infant world of distributed data base management.

Industry observers say the products will continue to propel Oracle's growth for the next year and a half, but after that, Oracle may confront a lack of expertise in IBM 370 architecture and a possible competing distributed data base product from IBM.

Oracle's SQL Star includes Distributed Oracle for multiple-site query processing and single-site updates; SQL Net, which provides interfaces to a variety of communications networks and allows distributed processing among applications and data bases; and SQL Connect, which provides gateways to non-Oracle data base management systems.

Kenneth J. Burke, vice-president of Alex Brown & Sons in Baltimore, says the announcement keeps Oracle in the forefront of relational technology. But, he adds, "I'm not sure the market is ready for distributed data base management yet."

H. Michael Braude, vice-president of the Gartner Group, Inc., says Oracle's SQL Star will enable its revenue to continue to grow at a rapid pace for the next year and a half, but after that, it is likely to find it can't hire enough System 370 engineers to keep up its pace of product development and provide support. Oracle's revenue is projected to climb to $116 million in 1987, Oracle said.

Also, IBM is likely to come out with a distributed data base management system, code-named Star Burst, in 1988, Braude says.

Oracle and its rival, Relational Technology, Inc. of Alameda, Calif., are pioneers in the emerging field of distributed data base management. Relational Technology announced Ingres/Star, a distributed version of its SQL-based Ingres, in June, with a fourth-quarter delivery date.

Kenneth I. Cohen, Oracle marketing director, says the distributed data base products "provide a user with the illusion of a single, homogenous, SQL-based system" while accessing multiple data base management systems at scattered sites.

At this stage, the use of multiple sites per transaction is limited to querying. The Oracle products provide the processing intelligence to find information without the user specifying its location. As long as the proper gateways are in the network, Distributed Oracle can access other vendors' SQL-based systems and retrieve information, Cohen says.

Distributed Oracle is available immediately to run under IBM's VM/CMS mainframe operating system, Digital Equipment Corp.'s VMS operating system and the IBM Personal Computer operating system, PC-DOS. Initially, Distributed Oracle will be able to access IBM's VM relational data base management system, SQL/DS, he says.

Oracle retails for $1,000 on the PC, for between $24,000 and $96,000 on minicomputers and for $160,000 on the IBM 3090 Model 400. Fees for the distributed data base products will be an additional 25% to 50% of those prices, spokesmen said.

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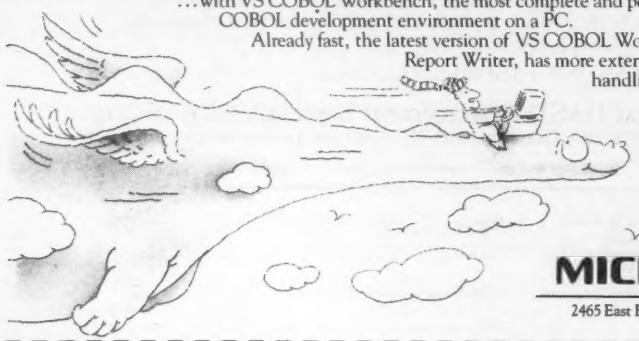

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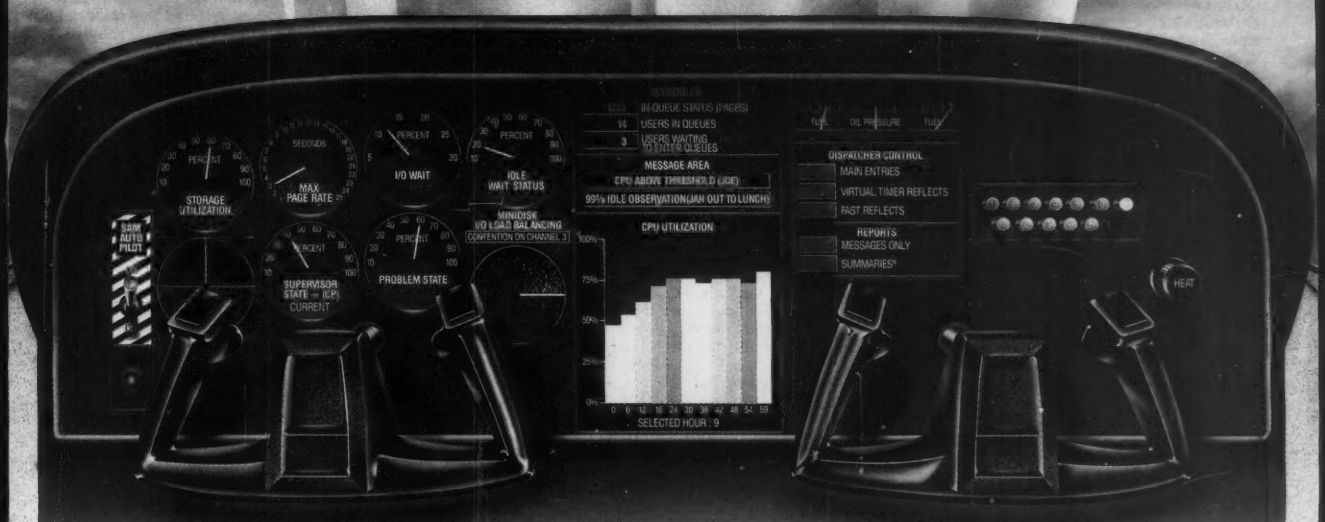

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Honeywell reorganizes in move to cut costs

Work force to shrink; divestiture rumor denied

By James Connolly

MINNEAPOLIS — Denying reports that it plans to sell off any of three operations, Honeywell, Inc. last week embarked on a partial reorganization and cost-cutting effort that will eliminate 4,000 jobs.

In conjunction with the reorganization announcement, Honeywell's directors authorized management to consider the purchase of Sperry Corp.'s aerospace business, which reportedly has been on the market since Burroughs Corp. agreed to buy Sperry earlier this year. The action came as rumors of more acquisitions and divestitures raced through Honeywell facilities and along Wall Street.

Speculation of further moves centered on reports that NEC Corp. of Japan and Groupe Bull of France — both partners of Honeywell in the computer business — were bidding to buy portions of Honeywell Information Systems and that Boeing Co. wanted to buy Honeywell's own aerospace operation.

The takeover rumors spread despite denials by the companies mentioned.

Reports said NEC plans to acquire Honeywell's minicomputer operation in Massachusetts and the large-systems operation in Phoenix. Other sources said Bull wants to buy the minicomputer operation.

Analyst Donald Bellomy of Framingham, Mass.-based research firm International Data Corp. said it could make sense for Honeywell to sell its computer operation. He added, "What NEC needs is a U.S. name. It needs the name of Honeywell if it is going to sell its systems here."

Bellomy theorized that acquisition of the Sperry aerospace group could provide Honeywell with the resources and leverage to divest itself of its computer operations.

However, analyst Michael Geran of E. F. Hutton & Co. said it is unlikely that NEC will buy Honeywell Information Systems — although it is possible NEC could move to acquire an interest in Honeywell, much as its rival Fujitsu Ltd. bought into Amdahl Corp. "In short, NEC wants the milk, and therefore, they don't have to buy the cow," Geran theorized. "I'm sure they are having talks about how to improve their relationship, but I don't think it means an acquisition. It could mean a NEC investment . . . but I doubt it."

In the meantime, Honeywell and NEC hammered out details of their 2-month-old joint venture to sell supercomputers in the U.S. and Canada and announced that the boards of both companies had approved company officers and a Burlington, Mass., location for the new Honeywell-NEC Supercomputers, Inc.

Former Computervision Corp. President James R. Berrett was named chairman of the board and chief executive officer of the new company, which is scheduled to begin operations in October. The company will sell NEC SX-1 and SX-2 supercomputers in the U.S. and Canada. Honeywell already sells NEC 1000 system mainframes as the Honeywell DPS 90 under a 3-year-old contract and plans to sell the next-generation NEC 2000 machine.

Under last week's reorganization, Honeywell's controls business will be placed under three units focusing on worldwide markets, including industry, aerospace and defense and residential and commercial buildings.

The work force reductions, to be completed by year's end, will be the second in three months for Honeywell, which employs 94,000 people worldwide. During the summer, the company cut 200 jobs at its Phoenix plant, where Honeywell makes its own mainframes in addition to distributing the NEC-made systems. Those reductions were accomplished through a voluntary early retirement program.

A Honeywell spokesman said no decision has been made about which operations the 4,000 jobs will be cut from.

In a formal statement, the company said, "The work force reduction will be accomplished through a combination of attrition, early retirements and layoffs. In addition, salary increases will be severely limited in 1987, and the company will implement other cost-cutting measures affecting most of its locations."

TOP OF THE NEWS

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not fully disposed of the issue. Digidyne Corp., which initiated the suit against DG after the Westboro, Mass.-based firm refused to license its RDOS operating system to makers of Nova-compatible minicomputers, last week said that it intends to pursue its case in court.

A hearing on damages is scheduled this week in U.S. District Court in San Francisco.

■

National Advanced Systems Corp. last week enhanced its Model 7900 Semiconductor Disk Subsystem by quadrupling its storage capacity and tripling the price. The 7900-2X offers from 128M bytes to 512M bytes, starting at $382,800.

■

Ashton-Tate joined the hordes of desktop publishing firms with the announcement last week of an agreement with Skisoft, Inc. to codevelop a desktop publishing package to run on IBM and compatible personal computers. Ashton-Tate refused to comment on product specifications, availability or pricing.

■

Apple Computer last week dropped the prices of its Macintosh family products. The Macintosh Plus was reduced from $2,599 to $2,199; Macintosh 512K Enhanced, was cut from $1,999, to $1,699; and the Laserwriter printer dropped $1,000 to $4,999.

ADR strategy keyed to micros

From page 1

tional data processing at the departmental level.

ADR's position is in sharp contrast to rival data base management system vendor Cullinet Software, Inc., which a week earlier announced development of a relational DBMS product for the Digital Equipment Corp. VAX, saying that minicomputers would be the engine driving departmental computing.

In last week's announcement, ADR said it is working on LAN versions of its DBMS Datacom/DB, Datadictionary, and D-Net for distributed data base applications. These products will become available at dates and prices that are still unspecified, according to Farrelly.

Farrelly committed ADR to a March 1987 delivery of a $1,500 version of ADR's fourth-generation language Ideal, dubbed Ideal Escort, for application development on PCs and LANs.

ADR has thus staked out a position as a supplier of traditional DP software to LAN users, even though, as ADR spokesmen agree, few large LAN users exist today.

But President Martin Goetz and other ADR officials say they believe IBM is urging its customers to move in this direction. Within a few years, networked PCs tied to mainframes will be generating a demand both for more millions of instructions per second on mainframes and more LAN software, Goetz predicted.

With the right software, networked PCs "can provide an alternative to the use of departmental processors," Farrelly told the ADR Cadre users group in a keynote address last week.

In addition, ADR officials believe IBM is about to announce the long-rumored entry-level 370 machine, based on the Micro 370 technology about which IBM has previously provided some details. It reportedly would run scaled-down versions of IBM's MVS and VM operating systems and, with CMOS microprocessors, would easily be plugged into departments to provide 370-family power for the LAN if needed, Farrelly claimed.

ADR, traditionally strong in IBM 370 mainframe tools, is seeking to "leverage" that strength into the departmental level, according to Michael Braude, vice-president of the Gartner Group, Inc. in Stamford, Conn., who attended the conference.

Braude said traditional LAN vendors, such as 3Com Corp. or Ungermann-Bass, Inc. have feared a mainframe software vendor will move into their market. A company like ADR, with its close ties to many IBM mainframe shops, will have a powerful platform from which to address communications managers seeking to integrate LANs into corporate data processing, he predicted.

"The people who make the LAN decisions in many cases will be the same or be working closely with the mainframe, data processing center people," he noted.

Customer reaction varied, but Farrelly's comments drew a consensus of approval. "I think it's great. PCs have phenomenally low costs, and users are tired of waiting on host systems," said John LaMora, project manager of the installation of Datacom/DB at Ralston Purina Co. of St. Louis.

Customers also applauded the broad effort to enhance ADR's traditional mainframe product line, but some suggested that its PC/LAN strategy might be too dependent on the market developing in the direction desired by IBM. "I don't see volume sales for the Micro 370," said John Firkus, senior assistant programmer of IFG Information Services, Inc., a financial holding company in Minneapolis.

The LAN products will be ADR's first C-language product set. Some of the products have already been converted to C through a contract with the federal government to produce C versions for Honeywell, Inc. minicomputers, Farrelly said.

In addition, the following developments were announced to users:

- ADR will interface its mainframe development tools with a relational data base management machine from Teradata Corp. of Los Angeles. No price was announced for the interface, slated to be available a year from now, ADR spokesmen said. Teradata machines are priced from $500,000 to several million dollars, Teradata President Ken Simonds said.
- ADR is in the process of developing expert-system technology for Look ESP, their PC-based product that will be delivered within a year. Look ESP will take data from ADR's mainframe performance monitors and analyze it to identify system bottlenecks.
- In a move to steal customers from a major competitor, Cincom Systems, Inc., ADR announced a package that will be priced in the $30,000 to $40,000 range that will allow the user of Cincom Systems' Total data base management system to migrate data to ADR's Datacom/DB. It will be available in the first quarter of 1987.
- ADR will expand support for IBM's relational data access command set, SQL. In addition to the company's data manipulation languages, SQL support will be provided to Ideal, Datadictionary, Dataquery and ADR/DL by the second quarter of 1987.
- A second release of Ideal this year will provide support for VM/CMS and performance improvements for both batch and on-line modes. Release 1.3 of Ideal was ready in April; 1.4 is due in December. Ideal retails for $97,900 for OS and $73,200 for DOS.
- Ideal will be integrated with ADR's source-code manager, Librarian, in the second half of 1987. With that step, Ideal's fourth-generation language programs can be controlled in the same fashion as third-generation programs.
- ADR will offer a performance monitor for its development language, to be called Look/Ideal, in the second half of 1987.
- ADR's electronic mail will be enhanced to support VM/CMS and IBM's Distributed Office Support System and will be integrated with Ideal and their product Dataquery for distributing reports through office networks.

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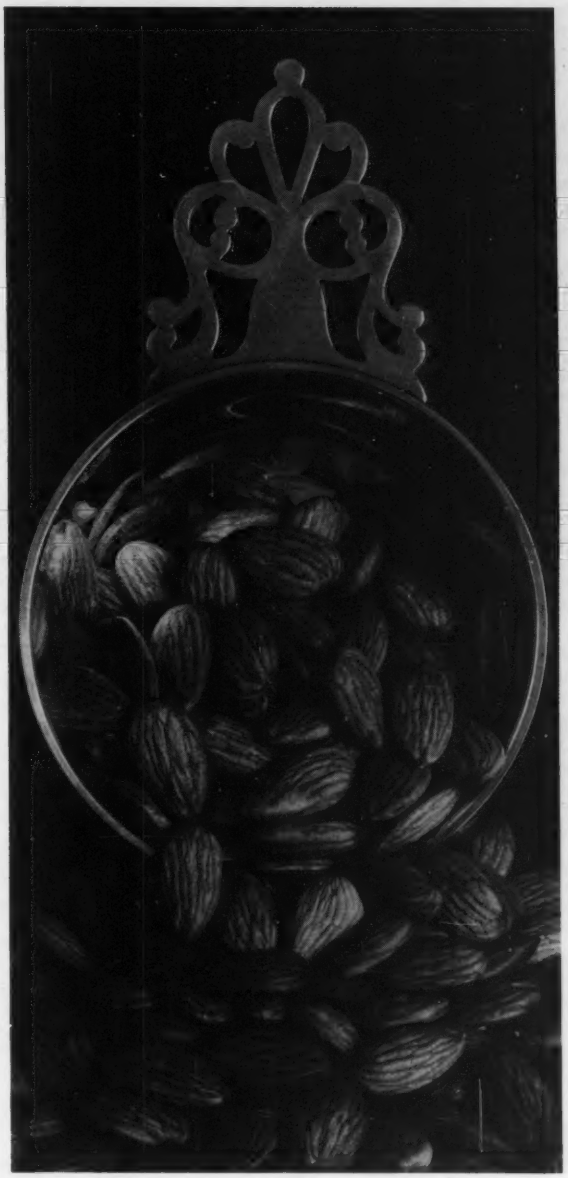

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Motorola unveils 32-bit, 8-MIPS 68030 chip

By David Bright

AUSTIN, Texas — Putting pressure on rival Intel Corp., Motorola, Inc. last week introduced a 32-bit microprocessor with double the performance of the MC68020, its previous high-end chip.

Motorola officials claimed the 8 million instructions per second (MIPS) 68030 would help maintain the firm's performance and market lead in the 32-bit microprocessor race and ultimately result in very cost-effective office automation systems.

"We believe the ultrafast, yet cost-effective, design of the 68030 will enable it to provide the performance required in next-generation engineering workstations and the price and functionality necessary to build high-volume, $2,000 to $3,000 office automation systems," said Murray Goldman, senior vice-president and general manager of the Microprocessor Products Group.

Goldmanclaimedthe68030boasts three to four times the performance of the Intel 80386 microprocessor. While not pin compatible with other 68000 chips, the 68030 is reportedly 100% software compatible with all chips in the group.

Samples of the chip should be available in March, but volume production of the initial 20-MHz version will begin in fourth-quarter 1987.

Analysts were enthusiastic about Motorola's development. Dataquest, Inc. analyst Elizabeth Levy said the 68030 provides a needed upgrade path within the 68000 family and should keep some systems vendors from switching to the Intel camp.

Despite the enthusiasm, however, all parties agree that the 68030 has one drawback when compared with the 80386: its inability to run Microsoft Corp.'s MS-DOS. Systems built around the 68000 family of chips generally run the Unix multiuser operating system.

Aquino meets high-tech reps

By David A. Ludlum

BOSTON — Representatives of four U.S. companies planned a weekend meeting in Boston with Philippine President Corazon C. Aquino to discuss steps that could be taken to assure free elections in that country next year.

Aquino planned to meet amid tight security Saturday with representatives of Digital Equipment Corp., Lotus Development Corp., Polaroid Corp. and Coopers & Lybrand at Lotus's headquarters.

The gathering was arranged by Allen Weinstein, president of the Center for Democracy, a nonprofit foundation affiliated with Boston University. The Center for Democracy claims to be dedicated to promoting democratic institutions in the U.S. and abroad.

Weinstein brought the companies together to try to provide technical advice and support for the Philippine government's Commission on Elections and for the Philippine citizens' group, the National Movement for Free Elections, according to Paul Nathanson, a deputy director of the Center for Democracy.

The organizations hope to revamp the Philippine electoral process, which was tainted and manipulated under former President Ferdinand Marcos, Nathanson said.

"The companies are looking at the technical merits of what they have now. The ultimate goal is to help the Philippines update the voter registration list and make sure it's as clean as possible," said a source at Lotus who requested anonymity.

Big users get Apple loaners

From page 1

Local dealers will provide support for the borrowed equipment and will handle any resulting sales, according to Sandra Sakaguchi, Apple business programs specialist.

"The main purpose is to place solutions. They'll tailor the package to the corporate customer," Sakaguchi said. Every customer would not receive the same software, she added. The software selection ranges from engineering to word processing products; most of the packages will be suggested by the business development managers.

Apple Laserwriter printers, Imagewriter printers, external disk drives and hard disks will also be available with the loaned systems. According to Sakaguchi, each system will be configured to the borrower's interests.

'Very smart idea'

"It seems like a very, very smart idea," said Dave Winer, president of Living Videotext, Inc. of Mountain View, Calif., whose outline processor More is among the programs available for loan. "Apple has to get some IBM Personal Computer users to take another look at the Macintosh," Winer said, thus showing them that the current model is more powerful than the original.

Aldus Corp. of Seattle looks at the loan program as "a way for us to get our product in front of people who might be interested but aren't ready to buy yet," said Michael Solomon, vice-president of sales and marketing.

Macproject and Macdraw from Apple and Microsoft's Word and Excel will also be among the software selection. More software packages will be added as they are released, Sakaguchi said.

Length of loan variable

"These evaluation products can be used to ensure Apple is on a corporation's approved vendor list," Sakaguchi said. She added that the length of the loan is up to the business development manager, but it could last as long as a formal evaluation period, if necessary.

Apple previously offered some evaluation units directly, with sales resulting from more than 75% of the loans, Sakaguchi said. The new program supplies each regional business development manager eight systems to lend as needed.

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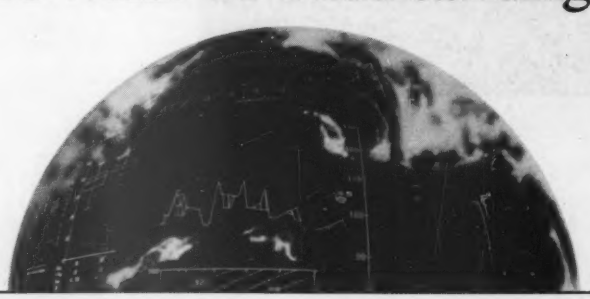

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MAP enthusiasts settle down, take long-range positions

Evolving status dampens ardor

By Rosemary Hamilton

ANN ARBOR, Mich. — Euphoria has turned to realism in the movement to establish the Manufacturing Automation Protocol (MAP) as the nation's factory networking standard.

During the past year, a number of major corporations have lined up behind MAP founder and prime user General Motors Corp. Many of those companies say, however, that they are still cautiously reviewing MAP and do not expect to have the network standards in place until 1988 or 1989.

According to Stephen Hagan, manager of automation engineering at an NCR Corp. manufacturing plant in Wichita, Kan., "A year ago, everybody was enthusiastic. Now it appears that reality is setting in. The vendors are still waving the flag, but the users are becoming more knowledgeable and more critical of the MAP promise."

Hagan was one of approximately 600 users and vendors who gathered last week for the fall session of the MAP/TOP User Group. Attendees also support the Technical and Office Protocol (TOP), sponsored by Boeing Computer Services Co., which is designed to be MAP's equivalent in office environments, although it continues to lag behind MAP in user support and product development.

Nearly 30 announcements

Nearly 30 vendors made presentations at the meeting, a number of which concerned new products. IBM made its public introduction of a series of products from Industrial Networking, Inc. that it will resell, and AT&T announced a pilot project with Concord Communications, Inc. involving fiber-optic technology.

Concord Communications also introduced a controller card for the IBM Personal Computer that is compatible with MAP Version 2.1 and will sell for $2,696. Earlier this month, Industrial Networking rolled out a similar product that will sell for approximately $800 more.

The MAP effort, which had slowly gathered momentum in the early 1980s, skyrocketed to fame after the 1985 Autofact Conference and Expostion, at which GM and other users and vendors demonstrated a working MAP network model.

In the Autofact aftermath, users embraced the concept of MAP, swelling the ranks of the users group both in the U.S. and abroad, and vendors by the dozen announced their support of the manufacturing networking standard.

But at the recent users group meeting, a number of attendees, while still enthusiastically supporting MAP, also said they expect to proceed slowly with it. Some users said they continue to feel uncomfortable about MAP's evolving status.

Others noted the high cost of MAP products and installations and said they would prefer to wait until those costs come down. Still others said they see a slow movement away from their exsiting networks, which in many cases represent a considerable investment, to a MAP-based facility.

"This is our biggest group, and so far these people seem so knowledgeable," said Michael Kaminski, MAP project manager at GM. "They know what they're interested in. They're not just looking."

'At the strategy level'

For example, the new products were not of major concern to Robert Awde, an engineering specialist at General Mills, Inc. in Minneapolis. "We have lots of time and resources," he said. "It doesn't make sense to implement MAP at this stage, because it hasn't evolved yet into its final stage. Basically, we're at the strategy level. We will be writing a report that contains recommendations for MAP, and we hope to implement a pilot program in 1988."

MAP, first developed by GM, is a set of specifications, some of which are still evolving, based on the International Standards Organization's seven-layer Open Systems Interconnect model. The seven layers are set up to provide protocols for the various components of the communications process.

A Caterpillar, Inc. facility in Layfayette, Ind., has a long-range MAP goal similar to that of General Mills, according to Thomas Dozier, a senior systems analyst. The plant is "locked into an 802.3 baseband Ethernet for the short term," Dozier said. While Caterpillar has a strong interest in MAP, he said the company continues to work on its "road map for future automation."

Hagan, at the NCR manufacturing facility in Wichita, said, "Right now, MAP isn't stable enough to make a statement that we should go corporatewide with it."

Nonetheless, Hagan's plant purchased a MAP starter kit from Industrial Networking earlier this year and is currently writing interfaces to perform functions such as file transfer and messaging. But the plant actually runs on a 400-node Ethernet network, of which Hagan said, "I'd say it'll be the middle to end of 1989 before MAP's as usable."

Another of Hagan's concerns is price. A preliminary study done by an outside consulting firm showed that a MAP connection on a network could cost as much as 10 times more than an Ethernet connection. "I view it right now as a technological investigation.

Eventually, we're hoping there'll be enough MAP equipment in the market to drive the prices down," Hagan said.

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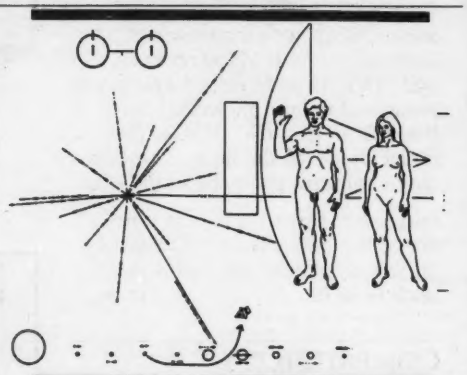

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Despite upgrades, federal computer average age found high

GSA plans to reduce procurement time

By Mitch Betts

WASHINGTON, D.C. — The federal government's computer inventory is, on average, twice as old as the computer inventory of Fortune 500 companies, partly because some federal agencies are saddled with 12-year-old supercomputers from Control Data Corp.

That is the conclusion of a recent study by the U.S. General Services Administration (GSA) investigating the government's reputation for having obsolete computers.

Uncle Sam's typical outdated computer is kept by a large scientific research agency, such as the Department of Energy, and was made by CDC or Honeywell, Inc., according to the study.

Francis A. McDonough, the GSA's deputy commissioner for information resources management, said the study showed that the government has pockets of obsolescence but that, overall, government computers are not as old as some critics have charged.

The Grace Commission reported in 1983 that federal computers were 2.7 times older than private-sector computers. But the GSA's study, using Framingham, Mass.-based International Data Corp.'s nationwide computer data base, found that federal computers were 1.5 times older than those in the private sector as a whole and 2.1 times older than the computer inventories of Fortune 500 companies.

"In reality, we found a large inventory of new computer systems in all sectors of the government," the study reported. "If we could correct selected pockets of outdated equipment, the government would compare favorably with the private sector."

While the GSA was pleased to refute the notion that the U.S. government has a collection of ancient computer systems, McDonough said the GSA will work to wipe out the pockets of obsolescence, in part by finding ways to cut the procurement time for new systems to 12 months or less [CW, March 3].

The GSA's study found that the private sector retains its computers an average of 81 months — 58 months in Fortune 500 companies — compared with 123 months in the federal government.

The study singled out the government's 40 outdated CDC supercomputers for making the government's statistical average look worse. When the CDC computers were removed from the federal inventory, the average age of government computers dropped to 71 months.

Agency officials said that CDC has not provided an easy migration path for replacing the old equipment and that most research agencies are unable to afford new supercomputers.

The study compares a data base on 1.5 million computers throughout the U.S. with a verified government data base of 13,000 large computers. It covers only those computers that cost more than $50,000.

Microsoft lets micros read CD-ROMs

By Douglas Barney

REDMOND, Wash. — Microsoft Corp. last week announced extensions to its MS-DOS microcomputer operating system that allow personal computers to read data from compact disk/read-only memory (CD-ROM) disks.

"It is important for there to be a seamless way of integrating CD-ROM drives with existing applications. Microsoft has worked to make these extensions a well-integrated part of the operating system," said Marty Taucher, a Microsoft representative.

The extensions allow a CD-ROM disk formatted to the High Sierra Group file format to appear like any other magnetic disk drive to both the application and the user.

The High Sierra Group consists of 13 corporations interested in the development of a standard file format for CD-ROM disks.

Unlike most magnetic drives, which are limited by MS-DOS to 32M bytes in a single volume, up to 550M bytes of a CD-ROM disk can be formatted into a single volume. Existing applications can now access CD-ROM disks without modification.

The extensions are not currently part of MS-DOS and consist of a hardware-independent program and a hardware-independent device driver. These extensions will be provided only to CD-ROM manufacturers on an OEM basis. MS-DOS 3.1 or 3.2 is required to make use of the extensions.

Firms committed to writing CD-ROM applications compatible with Microsoft's MS-DOS extensions include Knowledgeset Corp., Publishers Data Service Corp., TMS, Inc. and Reference Technology, Inc.

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School begins first computer literacy program

Competency test soon to become requirement

By James A. Martin

TALLAHASSEE, Fla. — The first program in the nation to require public school students to obtain minimal computer skills began this month in Florida and will eventually require children to pass competency exams in order to progress to the next grade.

The computer skills program is part of an education reform act that requires students to possess and demonstrate adequate reading, writing, mathematics, science and computer abilities.

Florida public school students from kindergarten through 12th grade are being taught the basics of operating a microcomputer as well as programming and running a software program.

Computer literacy will be measured first at the beginning of the third grade, followed by additional testing at increasingly higher levels in the fifth, eighth and 10th grades, said Peter Lenkway, computer education program specialist for the Florida Department of Education in Tallahassee. Testing for computer skills is not expected to commence until the 1988-1989 school year.

The emphasis on computer literacy is a result of a 1983 amendment to Florida's Education Reform Act. The reform was first adopted in 1977 to provide a minimum testing program at four grade levels in reading, writing and mathematics.

Each school district is responsible for purchasing the microcomputers and administering the computer literacy instruction and testing, Lenkway said. The testing will be administered at the beginning of a school year so that students who perform poorly have the rest of the year to improve, he added.

"We are talking about teaching a minimal program," Lenkway said. "What we will be testing on is the very least we would expect a student to know."

Privacy proposal meets opposition

By Mitch Betts

WASHINGTON, D.C. — The Reagan administration last week opposed a congressional proposal to create privacy oversight boards at each federal agency, but it expressed support for protecting individual privacy rights during government computer matching programs.

Joseph R. Wright Jr., deputy director of the president's Office of Management and Budget (OMB), testified at a U.S. Senate hearing that creation of Data Integrity Boards at each agency would add a needless layer of bureaucracy.

As an alternative, he offered to beef up existing OMB directives to address criticism that OMB has neglected privacy protection.

The testimony came at a hearing on a privacy bill sponsored by Sen. William S. Cohen (R-Maine). The bill, which will be on the congressional agenda next year, would set rules for computer matching and establish Data Integrity Boards to oversee, approve and review matching programs [CW, Sept. 1].

> ***Wright testified that OMB's existing rules place a high priority on privacy protection and that further controls would be costly and burdensome.***

Wright testified that OMB's existing rules place a high priority on privacy protection and that further controls would be costly and burdensome.

But researchers from Congress' Office of Technology Assessment and General Accounting Office testified that the OMB has not provided sufficient oversight of computer matching and generally endorsed Cohen's bill.

The Reagan administration has aggressively pursued computer matching — comparing one agency's data base with another's in search of discrepancies — as a tool for detecting fraud in government programs.

Critics say computer matching is contrary to the intent of the Privacy Act of 1984 because information collected for one purpose is used for another and individuals are given only scant notice that their files are being cross-checked and have little opportunity to verify or refute the computer data [CW, July 7].

The American Civil Liberties Union and the American Bar Association (ABA) both support Cohen's bill, although each group has said that the bill does not go far enough in controlling the proliferation of computer matching and verification programs.

Ronald L. Plesser, a representative of the ABA, said Congress should enact legislation that would prevent the government from sharing sensitive data on citizens, such as personal tax information, medical records, census data and data on citizens' political and religious beliefs.

VSAT nets assume larger role in big business applications

By Stanley Gibson

Convinced of the benefits promised by very small-aperture terminal (VSAT) satellite networks, several large corporations are moving ahead with plans to build new networks or improve existing ones.

With widely separated locations nationwide, the corporations seek to reduce their expenses for terrestrial leased lines and packet-switched networks. They also believe they will have greater control if they own and operate a network themselves rather than rely on a long-distance company or a value-added network.

K-Mart Corp., which will be installing some 2,000 VSATs in its network, began by seeking the best design for an all-data, terrestrial packet-switched network. The intent was to take over dial-up batch transmissions and on-line credit card authorization.

The firm favored a CCITT X.25 packet-switched network; however, as it received proposals from vendors, it found that the X.25 packet-switched concept could apply equally well to satellite transmissions, according to Walter Z. Bzdok, senior director of corporate communications and systems reliability for K-Mart.

> ***While K-Mart's network grew out of a desire to transmit data, but is now planned to include video, Chrysler Corp. built its network for video but may adapt it to handle data.***

Once a satellite network was settled on, the firm found it could add video to the network at a price of about $1,000 per terminal.

"There was some coolness at first," Bzdok said of corporate response to a private video network. "Now, management wants video before data," he added.

Network cost-justified

K-Mart, as the biggest Visa and Mastercard accepter in the world, was able to cost-justify the value of its planned network on the basis of credit card verification alone, according to Bzdok. The cost of video air time, excluding production costs, will be 75 cents per minute per store. At that price, the problem might be to keep people off the air, Bzdok joked.

Compared with a terrestrial X.25 packet-switched network, K-Mart will save $100 million over the next 10 years, Bzdok said. The network itself will cost $55 million to build. Future plans call for adapting the network to handle debit cards and on-line check authorization.

While K-Mart's network grew out of a desire to transmit data but is now planned to include video, Chrysler Corp. built its network for video but may adapt it to handle data, according to Peter D. Hollinshead, who is communications programs manager for Chrysler.

Chrysler's C-band network has been operating for two years, but the expense of building C-band earth stations has limited the auto maker to having only 24 of them. Chrysler may convert to Ku-band, which will permit less expensive earth stations to be placed at a greater number of locations, including most dealers' premises.

'Impact can't be beaten'

"The impact and immediacy of live TV can't be beaten, although it will not replace videotape, fax and memos," Hollinshead said. Chrysler uses its network primarily to demonstrate maintenance techniques to service representatives and to train sales representatives, he added.

Tim Furst, general manager of Bmus Corp., a subsidiary of Microage Computer Stores that provides satellite video services to the retail chain's dealers, predicted all micro retailers will operate similar networks.

"I think next year at this time, the whole micro industry will be wired up with satellite video," he said. Microage uses the network to keep its dealers informed of new products and to train them in sales methods.

GM to rely on satellites

General Motors Corp.'s company-wide network, currently being designed by its EDS Corp. subsidiary, will rely greatly on links provided by two corporate satellites, according to Hartmut Burger of EDS. One satellite is scheduled for launch in 1989, and the other will go up in 1990, Burger said.

The satellite transmissions, which will carry voice, data and video, will be part of a corporate communications fabric including terrestrial microwave and fiber-optic lines.

GM's satellite network will consist of six hubs and thousands of VSATs. Burger said the number of earth stations could be as high as 100,000 VSATs if the installed cost of a VSAT station can be brought below $10,000.

Gene Amdahl describes new enhancements to ELXSI's System 6400 parallel multiprocessing computer.

"...our new M6420 processor and 768 Mbyte memory give you a more powerful tool. Our new VMS compatibility makes the tool even more widely applicable."

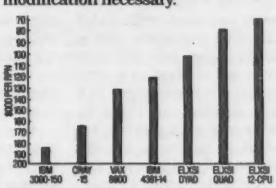
"Although the ELXSI™ System 6400™ has already filled the gap between supermini and supercomputer very well, we recently saw a chance to make important product enhancements.

New, extended performance CPU

"The most significant introduction is our M6420 Extended Performance CPU. Benchmarks show performance improvements of up to 200 percent over our existing M6410 processor, which boosts the high-end performance of the System 6400 to well over 100 Whetstone MIPs.

"With its plug-in parallel processing capability, this gives the System 6400 a price/performance advantage over almost any equivalent system, from VAX and IBM models (see bar-chart) up to and including the Cray 1-S supercomputer.

"Because of the System 6400's architecture, this new processor won't obsolete any of our existing M6410 CPUs – they'll work side by side in the same system, with no modification necessary.



Price/Performance of systems from Cray, DEC and IBM, compared with a dual-M6420 ELXSI Dyad, a four-M6420 ELXSI Quad and a fully configured 12-M6420 ELXSI system. Bars represent published system prices divided by a Relative Performance Number (RPN). This number is based on relative performance data reported in ComputerWorld Roundup, plus ELXSI benchmark test results.

Internal memory boosted up to 768 Megabytes

"New memory arrays provide up to 768 Mbytes of internal memory, using 256 Kbyte RAM chips. That's the largest main memory available today in anything short of a supercomputer!

"What's more, we are now testing one-Megabit RAMs, and in early 1987 we'll offer arrays with up to two Gigabytes of system memory, which can be installed into existing System 6400s immediately. No reworking necessary.

"Up to now, users with memory-dependent applications, such as IC design or circuit simulation, could only work with a portion of their models in main memory at one time. Now they can load entire 15 or 20 Mbyte models, and larger. They can work with the whole thing in real time, eliminating complicated overlays or program segmentation schemes.

"This capability alone can speed up processing time on a par with a faster CPU. In fact, large memories allowed one ELXSI user to bring a new product to market three months ahead of schedule.

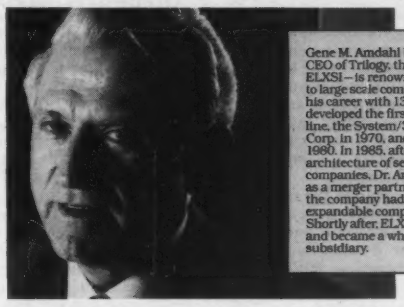
New compatibility with DEC systems

"ELXSI has an ongoing commitment to compatibility with DEC™ VMS™ environments. Our new EMS™ Environment software will give VAX™ users a simple migration to a powerful parallel multiprocessor, our System 6400, which will handle all their applications in conjunction with their existing VAX equipment.

"This EMS software emulates a VAX computer more closely than any other computer available today. It allows VAX users, with no additional training, to perform almost any job on an ELXSI system which can complement and extend the capabilities of the largest VAX with 24 times more memory and more than six times the processing power...and provide parallel processing as well.

"The new products include ECL,™ which emulates the DCL™ Digital Command Language interpreter; ERT,™ which emulates the VMS System Services and Run-Time Library routines; and an EDT-compatible Editor.

"By the first quarter of 1987, ELXSI will support CommUnity,™ a DECnet™ Phase IV End Node emulation, enabling our 6400s to communicate with VAXs running DECnet Phase III and later versions."



Gene M. Amdahl Ph.D. – Chairman and CEO of Trilogy, the parent corporation of ELXSI – is renowned for his contributions to large scale computing. Dr. Amdahl started his career with 13 years at IBM, where he developed the first compatible mainframe line, the System/360. He founded Amdahl Corp. in 1970, and Trilogy Systems, Inc. in 1980. In 1985, after evaluating the system architecture of several parallel processing companies, Dr. Amdahl selected ELXSI as a merger partner after concluding that the company had the most advanced and expandable computer in the industry. Shortly after, ELXSI merged with Trilogy Ltd. and became a wholly owned Trilogy subsidiary.

ELXSI makes large-scale computing practical

ELXSI introduced the first commercial parallel processing computer in 1983, and today has major installations around the world.

System 6400 computers serve hundreds of users at a time, performing a wide variety of sophisticated technical and scientific applications in aerospace, electronics and government labs, and in large UNIX operating system environments.

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VIEWPOINT

EDITORIAL

When users shape standards

The speaker was the head of one of the nation's largest computer manufacturers, and he was talking to one of our reporters about General Motors Corp. and its efforts to effect the Manufacturing Automation Protocol. GM, the gentleman opined, should stick to making cars and stay out of making computer equipment standards — as should other amateurs. (Translate, users.)

Granted, vendors that have invested millions or billions of dollars in the creation of products that adhere to certain standards may be understandably disgruntled when users step in and disrupt that process by opting for *different* standards.

But his comment smacks of a we-know-what's-best-for-you attitude that violates a cardinal rule of doing business, *any* business: Give the customer what he wants, not what you think he needs. Or, put another way:

Rule #1: The customer is always right.

Rule #2: When the customer is wrong, consult Rule #1.

Now of course, computer vendors will contend that such simplistic rules are fine for eliminating bugs from Release 9.7 of some spreadsheet program, but they just do not apply when it comes to something like the intricate business of setting standards. Especially when, as with MAP, users from enterprises of various sizes and shapes lobby for those nuances that meet their individual needs. But organizations struggling to cope in a competitive marketplace cannot simply tailor their needs to suppliers' product strategies; they must forcibly push vendors to comply with their business requirements.

Electronic Data Interchange, the subject of this issue's Executive Report, is an excellent case study of a highly successful user bid for standards. As a number of industries — most notably auto manufacturing — fought to increase productivity, they saw the clear benefit of electronically exchanging formatted business information, such as invoices, purchase orders and the like. They introduced systems for paperless transactions and pushed their suppliers to do the same — or lose business.

That push from within some 30 industries — transportation, retail, grocery, chemical and others — not only helped stimulate the emergence of a broadly accepted standard but also pressured vendors to develop relatively inexpensive software and services.

EDI is a departure from the typical path to standards, having sprung entirely from users and being limited to one very well-defined application. Not so standards such as MAP and the Technical Office Protocol, which are supposed to support a wide range of communications needs for diverse manufacturers. Both are user-driven (by GM and Boeing Computer Services Co., respectively), but the computer equipment vendors are part of the process, having been pointedly commanded to implement these protocols on their own systems.

Some, like the computer executive who would relegate users to amateur status, may argue that in the MAP/TOP case, user involvement slowed the standards-setting process. True, the road to consensus in the MAP/TOP world continues to be tortuous.

But speed is not the point. The point is that whatever standards eventually evolve must serve critical, individual user needs, or be deemed useless.

LETTERS TO THE EDITOR

Orchestrating contract negotiations

Bertram S. Reese's comments on managing vendors in "Managing vendors: Be reasonable, flexible and valuable" [CW, Aug. 25], were, for the most part, on target. He correctly states that a cooperative stance with a vendor will yield the best results. However, there are some areas in which I believe a more assertive posture is appropriate.

Contract negotiations is one such topic. To state that ". . . regardless of the negotiations, the contract will always be to the vendor's advantage" is bad advice. In fact, contracts are often restructured so that the buyer has a performance-based contract that can measurably affect project success. By incorporating performance criteria into the document, a buyer can ensure that both implementation support and system function approach the prepurchase hyperbole so often present.

Prior to starting a consulting company, I spent over a decade in management positions with major software vendors and facilities managers. From the perspective of an insider, I can tell you that only three contractual areas are critical to a vendor. They are, first, to protect copyrights of the software product; second, to be paid; and third, to prevent recruiting of the vendor's employees by the client. Note that amount of payment, system acceptance considerations and deliverables are not on the list. These are all negotiable items.

My advice is to identify the critical deliverables and performance factors needed to successfully conclude the implementation and to negotiate hard for those factors. In the desire to close a major software sale, vendors often reach a point where there is a high degree of flexibility. The only "trick" is to know when this point is reached and then to know which provisions are truly important to pursue.

Ed Praytor
President
Systems Management Resources, Inc.
Atlanta

Faster micros offer users control

I believe your editorial, "The race for a faster chip" [CW, Sept. 1], completely misses the significance of Intel Corp.'s 80386 chip.

If you had been paying attention to your associate, William Zachmann of International Data Corp., you would know that faster microprocessors from Compaq Computer Corp. or Corvus Systems, Inc. offer users data processing capabilities at a hundredth of the cost of mainframes with roughly the same power.

If the 80386's power is wasted on spreadsheets, we would agree with your "savvy" MIS director who said, "Who needs a Corvette in a 15-mile-an-hour speed zone?"

Consider instead linking several Compaq 80386 personal computers together with a Novell, Inc. local-area network (LAN) and placing all of the corporate mainframe applications on the LAN. We are doing just that with IBM Personal Computer ATs and Novell LANs at our headquarters, and we expect to save 30% in ongoing software, hardware and personnel costs.

Master file data will continue to reside in a secured computer room (albeit much smaller) and be backed up regularly by a professional staff, but that is where the similarity ends. Users will schedule and initiate their own jobs, and the only delays will be those of waiting for data to arrive from the divisions.

We believe faster microcomputers are for downsizing equipment, reducing costs and giving users control over their own destiny.

I hope there are enough influential people in your audience who will ignore both your advice and those vendors pushing mainframes so MIS can do what it is supposed to do: provide management with the most cost-effective solutions available.

Richard J. Hock
Director, MIS
Echlin, Inc.
Branford, Conn.

A fear is an uncertainty is a doubt

In his letter to the editor, "Merit, not FUD, forms Ford's choice" [CW, Sept. 8], Efrem Mallach indicated that it was probably not fear, uncertainty and doubt (FUD) that caused Ford Motor Co. to choose IBM as its sole office automation vendor. Perhaps not, but his argument was not persuasive.

He suggested that having a "comfortable business partnership" can override technical considerations. In this context, however, comfort is nothing more than an absence of fear, uncertainty and doubt.

FUD by any other name is FUD.

Charles Brady
Gaithersburg, Md.

VIEWPOINT

Integrated Services Digital Network: Stalking the chimera

Even though the computer industry has evolved from the clear light of science, it is as riddled with mythology as any other human endeavor. We have our Davids and Goliaths, our heroes and fools, our legends and twice-told tales. And we are creating more myths all the time.

Consider, for example, Integrated Services Digital Network (ISDN). It seems straightforward enough. ISDN is, as communications consultant David Terrie points out, both a standard and a concept for integrating voice and data.

No mythology there. But if you take a closer look, you will see that ISDN has a few of the characteristics of the fabled chimera, a rather unpleasant ancient Greek concoction with a lion's head, a goat's body and a serpent's tail. Not surprisingly, the word has also come to mean, according to my battered but serviceable Webster's dictionary, "an illusion or fabrication of the mind: especially an unrealizable dream."

Now we are getting someplace.

You see, at one level, ISDN already exists. Motorola, Inc., AT&T and Siemens AG have announced ISDN chip sets, and a few ISDN terminals have seen the light of day. So it is real. Real, that is, if you look at it the way Terrie does, as, in the strictest sense, a Centrex enhancement that provides users of standard, twisted-pair phone lines with two 64K bit/sec. channels, one digitized for voice, one for data, and a third 16K bit/sec. channel for signaling. Terrie adds that ISDN also can be defined as a "specific physical and electrical interface that, if adhered to, will enable any vendor to plug in."

Once more we are skirting the fringes of reality. When we start talking about a universal network that allows anybody anywhere to plug in anything they have and connect whatever wherever they want to, we are back in the mythological realms where the ghosts of Advanced Communications System (ACS) and Net 1 live.

Remember AT&T's ACS, Ma Bell's own golem it tried to breathe life into and failed? Follow-on version Net 1, although less ambitious, also never saw the light of day; it became, like ACS, part of our folklore.

By JOHN L. KIRKLEY

Even if ISDN lives up to its own press releases, it will not really be with us as a viable solution until the mid-1990s. In the meantime, the show must go on.

Although they are as fond of a good myth as the next person, MIS directors and telecommunications managers are a notably hardheaded lot. They are beset by problems now, and a chimera is not their notion of an immediate solution. This is why T1 nets have become such a buzzword.

Solving present-day problems

T1 is here, and it works. It is not ISDN; in fact, it may someday be a subset of an ISDN network. However, T1 is not only solving present-day communications problems, it is having a profound effect on what ISDN may become.

The "backbones" that users are now constructing using the T1 multiplexers are rudimentary but do permit users to build the equivalent of their own private telephone network. Initially applied as a strictly port-to-port technology, T1 does not provide the global connectivity promised by proponents of ISDN. But with innovative product design and the increasing bandwidth being made available by technologies such as fiber optics, T1 is evolving at an enormous rate.

Witness two companies, one on the West Coast and one in the East. Both have helped to fuel the T1 fires.

Stratacom, Inc., located in Cupertino, Calif., introduced in July a distributed digital switching system called the Integrated Packet Exchange (IPX), a new high-speed packet-switching technique for T1 network management. The IPX provides toll-quality, four-to-one compressed voice connections by implementing packet switching at the nimble rate of 160,000 packets per second. This brings to voice the advantages that X.25-type packet switching brings to data. The product supports data transmission as well.

In Andover, Mass., a company called Network Switching Systems, Inc. has used T1 technology to create an integrated circuit and packet switch, one they claim can access any port under user or network manager control. Its president, Al Zuccino, predicts that, in two years, available bandwidth will quintuple today's levels.

Large organizations will react to this coming "bandwidth glut" by building more complex networks connecting more locations. Leveraging T1 technology, they will create general-purpose switched networks with dynamic bandwidth allocation, fault tolerance and true switching capabilities with the ability to route to any port. There will be more data moving, more data being shared and the interconnection of local-area networks (LAN) to create complex, wide-area networks that will look like simple LANs to the users.

High-capacity T1 inevitable

Sounds a bit like ISDN, doesn't it? Zuccino points out that although the move to high-capacity T1 (and eventually T2) technology is inevitable because of need, the move to ISDN is just as inexorable because of the players committed to making it a reality.

But the increasing sophistication of MIS and telecom managers who are now implementing T1 nets as well as the rapid evolution of T1 and other networking technologies will have a dramatic impact on ISDN. As ISDN begins to move from myth to reality, it will be forced to add capabilities and services that its backers did not envision when they first began pushing the idea.

Careful attention must be paid to these savvy users by the ISDN vendors that wish to be major players in the all-digital communications world of 1995. Otherwise, like the chimera and the golem, these companies, too, may become part of mythology.

Kirkley, a former editor of Datamation *magazine, is an industry consultant currently acting as editorial advisor to Patricia Seybold's Office Systems Group.*

Look both ways before crossing over to Unix

Take 10 MIS directors. Ask them to list three things that surface in every computer magazine or newspaper (including this one.) Unix will make eight of the lists.

Take the same 10 MIS directors. Ask them if they are using Unix. Chances are two or three will say yes. Most of those will be for specialized systems such as computer-aided design workstations.

This may be fine. We all read about submarines, but few of us drive one to work. What is in the news is not always of immediate use. But it is hard not to wonder if one should do anything about Unix.

Announcing Release 3.0 in June, AT&T claimed "a watershed in the commercial life of Unix System V." It spoke of networking capabilities "not available in . . . any other operating system on the open market." Strong words. And AT&T is not known for lying.

Yet the practical difficulties of doing useful work with Unix still exist. For one, its file system. It is a marvelous general-purpose concept and much of Unix's flexibility comes from the file system and using files for interprogram communication. AT&T has wisely built the new networking capabilities on it. But the generality and lack of imposed structure that make it a good communication mechanism make it unsuitable for data processing. True, "real world" file structures can be built on it. But they are not pure Unix files. Their structures are defined by compilers and data management software. There are no standards. Each vendor marches to its own drummer, and the vaunted Unix compatibility suffers a severe blow.

By EFREM MALLACH

A second problem is conversion. If Unix systems are to be more than network gateways, they must run applications, new or existing. New applications tend to involve existing files. Unix networking does not help use these, so existing applications must be converted. These needs limit the applicability of a new system, Unix or any other. Its opportunities are limited to independent niches, in freestanding applications, when new organizations are being formed or when a system conversion is called for in any case. A great deal of support from software suppliers is needed before Unix can compete for them on an equal basis with proprietary products.

This raises the package issue. Suppose you want an integrated office package. Unix has these, but they are fairly new and tend to be bug-ridden. Unix may offer some conceptual advantages over your current system. But if you want an integrated office package, the proprietary ones are real. They have been around for a while, they work and they come from your system vendor. You need more than conceptual operating system advantages to give this up.

The Unix user interface also has problems. It is not as bad as IBM JCL but it can get you into more trouble with an innocent mistake. Icon- and menu-based shells that hide Unix commands from the user also hide 90% of its power. If you like icons, get a Macintosh.

There are some things Unix does quite well. In developing large-scale software, the programmer's workbench has few if any equals. In some technical fields, the range of Unix-based applications is a big plus. If you are doing these, Unix may fit your operation. If not, do not get carried away by the bandwagon.

There are good systems that happen to use Unix. Products from Enmasse Computer Corp., Harris Corp. and Altos Computer Systems, Inc. come to mind. If one of them fits your needs, buy it. But buy it because of its merits, not because it has a Unix label.

If you have to change systems anyway, look at Unix. It is a good long-term bet. Using it will reduce your dependence on your hardware vendor, will ease much of your networking job and will smooth your next conversion.

But in 1986, Unix is neither standard nor dead. For most commercial MIS shops, it is like a submarine. Nice to read about — but don't order one tomorrow.

Mallach is associate professor of computer science at the Boston College School of Management and a consultant to top managers of vendor and user organizations.

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SYSTEMS & PERIPHERALS

HARD TALK
Jeffry Beeler

U.S.-Japanese tensions flare

For years, the dispute between U.S. and Japanese semiconductor makers smoldered as inconspicuously as the last surviving embers in a carelessly extinguished camp fire. Except for the American chip manufacturers themselves, almost no one paid the faintly glowing coals and their wisps of telltale smoke much attention — or grasped what the embers portended.

Even when the squabble finally burst into flames and prompted the U.S. industry to seek government help, most onlookers still treated the drama as a purely local phenomenon that held little or no significance for them personally.

Within the last few weeks, however, the quarrel between the U.S. and Japan has grown from a relatively minor neighborhood blaze to a wildfire that has spread far beyond the boundaries of the domestic semiconductor business. For the first time, the dispute has engulfed not only the companies that make components but also the ones that use those devices — the products of systems and peripherals, in other words.

Seeing that their own interests could soon go up in smoke, many systems and peripherals suppliers have shed their former indifference toward the semiconductor tussle and are now frantically summoning federal rescuers.

For the moment, all the hubbub poses little danger to MIS executives, most of whom have expressed no more concern about the matter than they would over a forest fire in another state. But if the current turmoil in vendorland continues to burn out of control, user organizations may be the next major group to feel the heat from

See **U.S.** page 22

Beeler is a Computerworld *West Coast correspondent.*

ADDS offers 68020 unit

Applied Digital Data unveils Pick system

By Alan Alper

HAUPPAUGE, N.Y. — Applied Digital Data Systems, Inc.'s (ADDS) systems division has unveiled a series of Motorola, Inc. 68020-based systems running a proprietary version of Pick Systems' Pick operating system and supporting between 16 and 160 users.

The three members of the Mentor 6000 series are ADDS' first systems based on the 68000 microprocessor family. They use parent company NCR Corp.'s Tower 32 product line as a hardware platform. ADDS continues to market its earlier Pick-compatible systems based on the Zilog, Inc. Z-8000 and Intel Corp. 8088 and 80286 microprocessors, which support from eight to 64 users.

Running the Mentor Operating System, ADDS' enhanced version of the Pick operating system, the Mentor 6000 family is software compatible with ADDS' earlier 16-bit systems and supports in excess of 4G bytes of disk storage.

"The new systems are for power users," said Robin White, vice-president and general manager of the systems division. "And they're modular in design for ease of field upgradability."

The entry-level Model 4 system supports 2M to 8M bytes of main memory, two 140M-byte disk drives, a 45M- to 60M-byte, ¼-in. cartridge tape, 16 to 64 serial ports and up to four parallel ports. Now available, a base configuration of the Model 4 is priced at $37,000.

The Model 6 also supports up to 8M bytes of random-access memory, a 140M-byte hard disk drive and a ¼-in. cartridge but supports up to two 344M-byte, 9-in. disk drives and a ½-in., 1,600 or 3,200 bit/in. tape drive. It supports between 16 and 112 serial ports and up to four parallel printer ports. Available in volume beginning in January, a base configuration of the Model 6 lists for $80,000.

The top-of-the-line Model 8 supports 4M to 16M bytes of memory, up to eight 56M-byte, 9-in. fixed disk drives, up to three ½-in. 1,600 or 6,250 bit/in. tape drives and a ¼-in. tape cartridge drive. Between 16 and 160 serial ports and up to four parallel printer ports are standard with the system. The Model 8 will also be available in volume in January; a basic configuration will cost $121,000.

To facilitate connectivity and field upgradability, ADDS is offering an I/O sub-

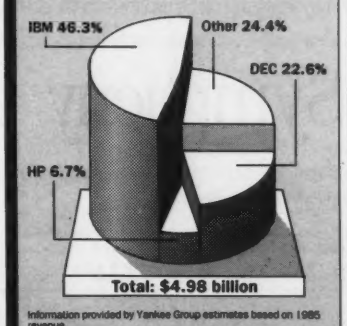
See **ADDS** page 23

DATA VIEW

MITCHELL J. HAYES

Factory Automation

IBM, Digital Equipment Corp. and Hewlett-Packard Co. grab 1985 market share.



Information provided by Yankee Group estimates based on 1985 revenue.

Supermicro into production

By Donna Raimondi

FOSTER CITY, Calif. — Third Coast Technologies, Inc. has announced that its multiuser and multitasking supermicrocomputer — aimed at business users — is out of beta test and in full production.

The company, formed in 1982 primarily to manufacture high-performance processors and memory cards for vision systems, has decided to expand its marketing efforts into the supermicrocomputer marketplace, a spokesman said.

The 286V, which runs under Theos Software Corp.'s Theos 286 virtual operating system, contains up to four Intel Corp. 80286 processors and is said to be configurable for up to 60 users. The basic unit costs $12,995 and consists of 1M byte of memory, a 52M-byte hard disk, eight serial

See **SUPERMICRO** page 22

INSIDE

Texet unveils high-end electronic publishing system on general-purpose workstations/**23**

NEW THIS WEEK

- Storage Concepts offers parallel transfer disk storage for VME-based systems
- For more on this and other new products, see pp. 103-117.

INSTANT ANALYSIS

"Whatever the arguments for and against MIPS may be, everybody seems to agree that using a relative performance scale is the right way to go. . . . That is the context in which one should view our MIPS ratings."

— Annex Research analyst Bob Djurdjevic on measuring systems in terms of millions of instructions per second.

ASCII terminal prices dip

By James Connolly

SAN JOSE, Calif. — Wyse Technology, Inc. has announced price cuts for two of its ASCII terminals and for its WY-700 monitor and graphics board subsystem.

The reductions reflect cost savings achieved through higher volume production, said Wyse Vice-President of Marketing Chuck Comiso. The price of the 2-year-old WY-50 terminal was cut from $599 to $499. The cost of the color WY-350 ASCII terminal was reduced from $1,195 to $999.

In addition, Wyse cut the price of the WY-700, which is designed for use with the IBM Personal Computer family, from $1,595 to $999.

Growth of PC-based solutions

Comiso said the drastic price cut for the WY-700 was made because of what the company sees as growing market acceptance of IBM PC-based solutions to desktop publishing, computer-aided design and manufacturing and other high-resolution graphics applications.

Prices of the entry-level WY-30 and high-end WY-60 terminals remain unchanged at $399 and $699, respectively.

Counterpoint introduces multiuser additions to System 19 product line

By James Connolly

SAN JOSE, Calif. — Counterpoint Computers, Inc. has introduced a series of multiuser systems to its System 19 family of Motorola, Inc. 68000-based computers.

The Unix-based System 19K is available in configurations supporting from six to 56 users at OEM prices ranging from $10,000 to $50,000.

The product reportedly can be configured with from one to six Motorola 16-MHz 68020 microprocessors and 600M bytes of disk storage.

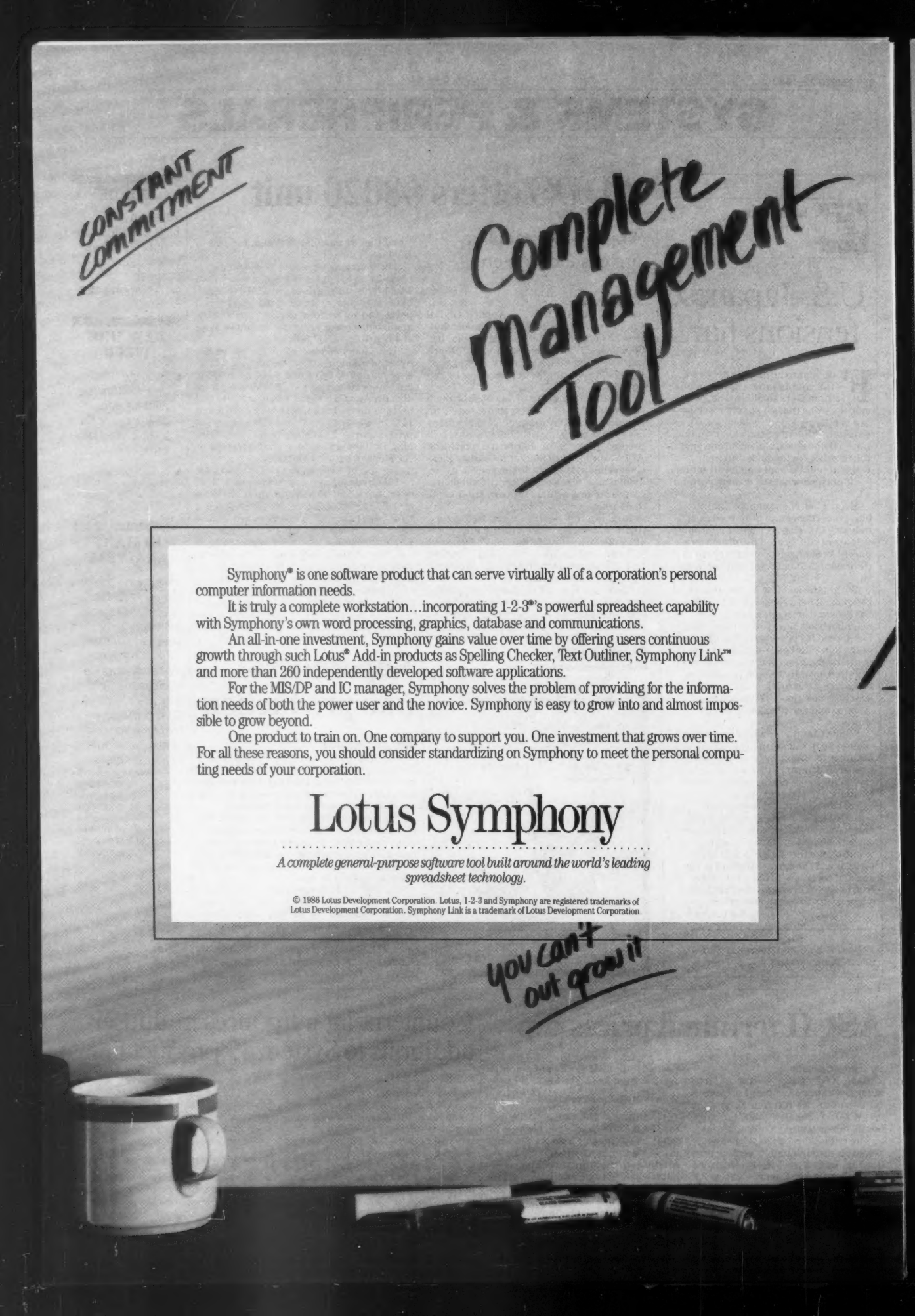
A Counterpoint spokesman said the System 19K was designed to extend from the low end of multiuser systems to the 56-user range without switching product families.

Supports bit-mapped graphics

He added that the System 19K supports bit-mapped graphics displays with 68020-based display processors.

A six-user, single-processor model with 100M bytes of Winchester disk storage is priced starting at $9,675 in

See **COUNTERPOINT** page 23



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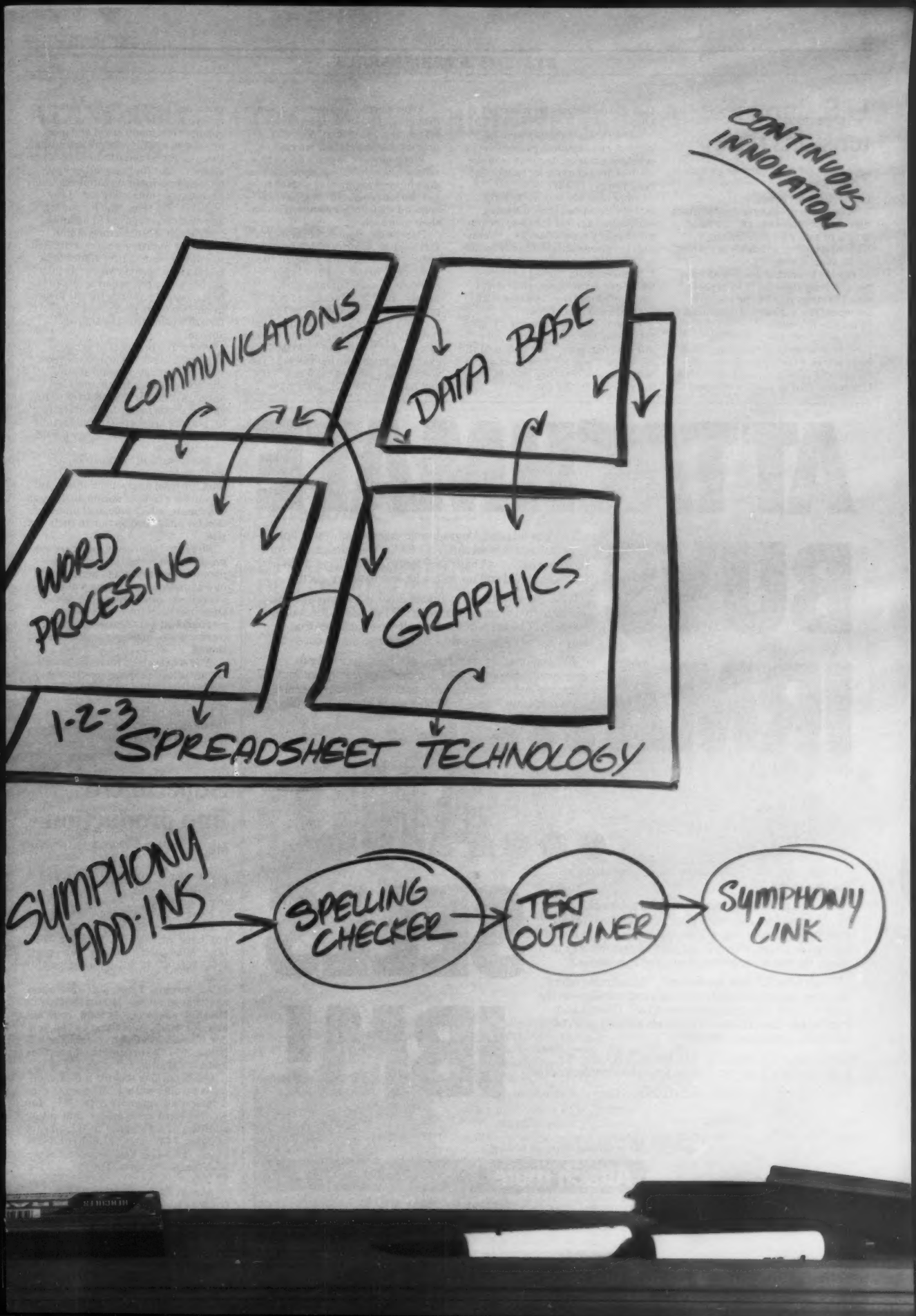
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SPELLING CHECKER
TEXT OUTLINER
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U.S.-Japanese tensions flare

From page 19

the onrushing flames.

A few observant systems directors may already have caught the faint aroma of ashes wafting through their open office windows or curling under their doors.

For the benefit of users who have been so busy fighting fires of their own that they missed the one now sweeping the industry, a little history may be in order.

Since at least the late 1970s, American semiconductor companies have accused their Japanese counterparts of selling components in the U.S. below cost to squelch competition and to increase their market share.

When the complaints went unheeded, the Japanese gained overwhelming market dominance in the critical area of dynamic random-access memory (RAM).

More recently, American chip makers expanded their dumping complaints against Japan to include another key class of devices — erasable programmable read-only memory (EPROM). This time, though, the U.S. government turned a sympathetic ear to the companies' plight and confronted the Japanese with their alleged misconduct.

"You fellows are causing a frightful mess in our country with your infernal dumping," the feds told the Japanese, "and we'd be most appreciative if you'd kindly refrain from the practice in the future."

After a prolonged period of foot-dragging, the Japanese confessed, in effect, to playing dirty pool and promised to mend their ways.

When news of Japan's decision reached Silicon Valley, domestic vendors heaved a collective sigh of relief. No longer would they have to contend with unfair competition on their own turf.

But the development that meant salvation to American chip makers spelled big trouble for many of their customers. In the wake of Japan's pledge to cease its dumping, the prices that U.S. systems and peripherals manufacturers have to pay for their electronic parts have shot through the roof. For certain classes of dynamic RAMs and EPROMs, for example, prices during the past few weeks have jumped between 100% and 600% in the U.S.; they have remained constant everywhere else.

To minimize their costs and stay competitive, many small and medium-size domestic vendors are now threatening to move their production offshore. But for many other systems and peripherals suppliers, such an option is financially out of the question. For them, the remaining alternative is to go out of business.

From an MIS director's standpoint, the industry's current difficulties might seem at first glance to be no cause for serious worry. As long as they enjoy continued access to the best possible products for the lowest price, few users really care whether the stuff is made in the U.S. or abroad.

As for the prospect of some impending vendor bankruptcies, most systems managers would simply shrug their shoulders in indifference. "Are either the industry or its customers seriously harmed if a few bit players are forced by misfortune to fall by the wayside?" they would probably ask.

But the loss of certain industry small-fry may matter more in the long run than many users think. As pundits are fond of noting, little guys contribute to technological innovation far out of proportion to their size.

So every failure of an obscure systems or peripherals manufacturer potentially represents a squandered opportunity for technological advancement, especially if the demise stems not from the firm's own mismanagement but from government intervention, however well intentioned.

And when a leap forward in technology is lost, perhaps irretrievably, users ultimately get burned. MIS executives may want to keep this point in mind the next time they dismiss the industry's growing conflagration as none of their concern.

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Supermicro into production

From page 19

ports, the operating system and a 1.6M-byte floppy disk in a 12-slot tower enclosure.

Expansion to a four-processor unit with 64 ports, 637M bytes of formatted hard disk and a ¼-in. or ½-in. tape subsystem for backup costs from $60,000 to $65,000, the vendor said.

An optional Theos Software package that emulates Microsoft Corp.'s MS-DOS operating system is available for $495. According to the vendor, Theo-DOS allows users to run existing MS-DOS programs, share files and lock records.

Other options include a disk caching controller with 4.5M bytes of random-access memory (RAM) for $5,679; hard disk drives that allow addition of disk space in increments of either 54M bytes ($1,995) or 382M bytes ($9,847); and zero-wait-state RAM, available on a 2M-byte card for $2,295.

Also available is either a ¼-in. cartridge ($1,950 to $2,800 for 60M-byte to 125M-byte units) or a 1M-byte, ½-in., open-reel tape drive subsystem for $14,995. An available compact disk/read-only memory unit costs $1,990.

ADDS offers 68020 system

From page 19

system, called Distributed Terminal Control Subsystem (DTCS), that connects up to 128 terminals to the system.

DTCS consists of a terminal controller with up to eight eight-port remote-terminal cluster controllers connected to a 1,000-ft coaxial cable and running from a Mentor system to the remote units in daisy- chain fashion.

When combined with two 16-port I/O controllers, up to 160 devices can be connected to a Model 8 system, ADDS said. Only one DTCS can be installed on a Model 6, the firm added. Base price of the DTCS is $4,000, while each eight-port cluster lists for $3,000.

Using DTCS, users can also decrease installation costs because of the single coaxial cable used to attach 64 terminals, White said.

To install separate cables for 64 terminals located an average of 100 feet from a computer would cost more than $30,000, he said, based on a typical cost of $5/ft ($15/ft in New York). "The installation of a single DTCS coaxial cable with a total length of 100 feet would be approximately $5,000," White noted.

> ❞
>
> ***To install separate cables for 64 terminals located an average of 100 feet from a computer would cost more than $30,000.***

In a separate matter, ADDS confirmed that it is suing Pick Systems, from which it licenses the Pick operating system, over royalties relating to the use of the operating system in the Mentor 6000 family.

A Pick licensee since 1979, ADDS filed the suit to get judicial interpretation regarding whether the ADDS license extends to Pick's Open Architecture operating system, White said.

"We're treating it as a disagreement among friends," White said. "We hope to get it out of the way before too long."

Counterpoint adds to System 19

From page 19

small OEM quantities, according to Counterpoint officials.

A 36-user, three-processor model with 200M bytes of disk storage and a 60M-byte cartridge tape drive costs $38,550.

The system software is Counterpoint's C-XIX operating system.

The company said C-XIX is a compatible derivation of AT&T Unix System V, Release 2.2, with University of California at Berkeley Unix 4.2 networking extensions.

Texet unveils high-end publishing system

Package designed for Sun-3 workstations

By Eddy Goldberg

ARLINGTON, Mass. — Texet Corp. recently announced the Live Page 3300 publishing system, marking the first time the supplier of high-end electronic publishing systems has made its software available on general-purpose workstations.

Based on Sun Microsystems, Inc.'s 32-bit Sun-3 workstation family and Texet's proprietary software, the Live Page 3300 front-end publishing system will be shipped Oct. 1 along with Version 3.3 of Texet's publishing software.

The vendor claimed that Version 3.3 will offer greater speed than Version 3.2 Plus, which was released in August. It will also allow indexing, scrolling, pan, zoom, enlarging and more math functions.

Includes workstation

The Live Page 3300 base system consists of a controller with an attached production workstation. It includes a Sun-3/160 workstation with 4M bytes of main memory, 330M bytes of storage expandable to 660M bytes, an Ethernet interface and an optional 60M-byte, ¼-in. cartridge tape drive for backup.

The Live Page 3300 system is designed to operate in a network cluster and comes with an interface to Texet's Live Wire 5000 local-area network.

Up to three Live Page 3340 diskless workstations can be attached to the base system via thin Ethernet cable.

According to company officials, Texet intends to bring the cost of a system to between $35,000 and $40,000 per seat.

The initial Sun-3/160-based system, which includes software, training and installation and interfaces to a laser printer and text input devices, will cost approximately $100,000. The addition of a diskless workstation will cost about $30,000.

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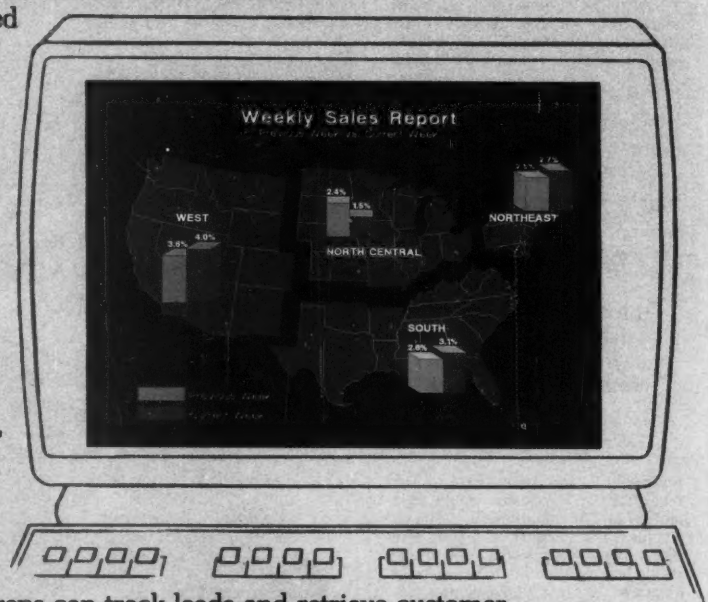

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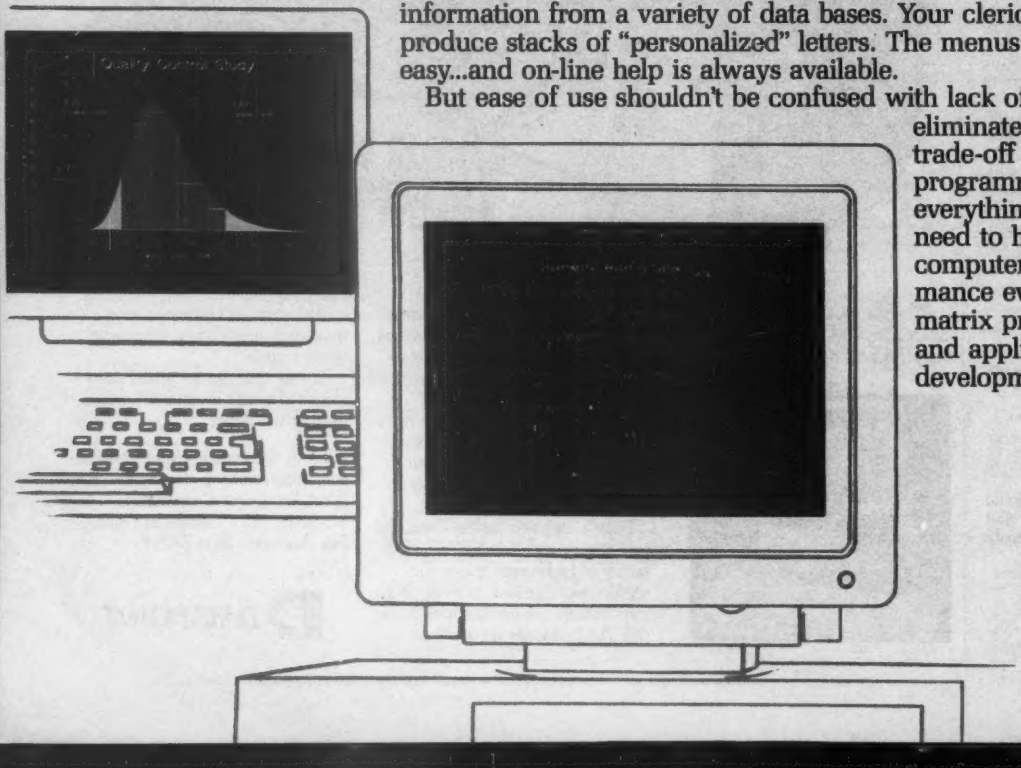

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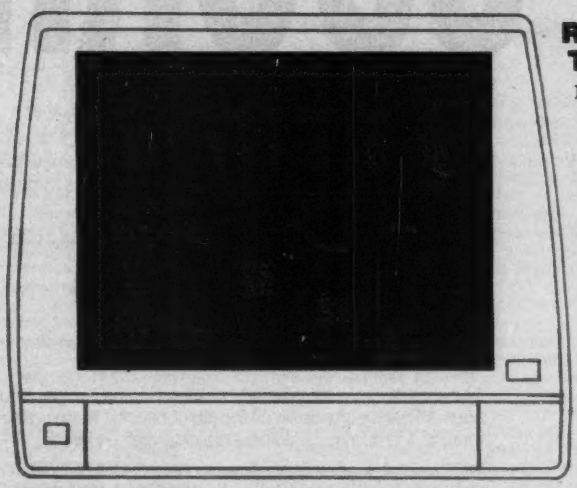

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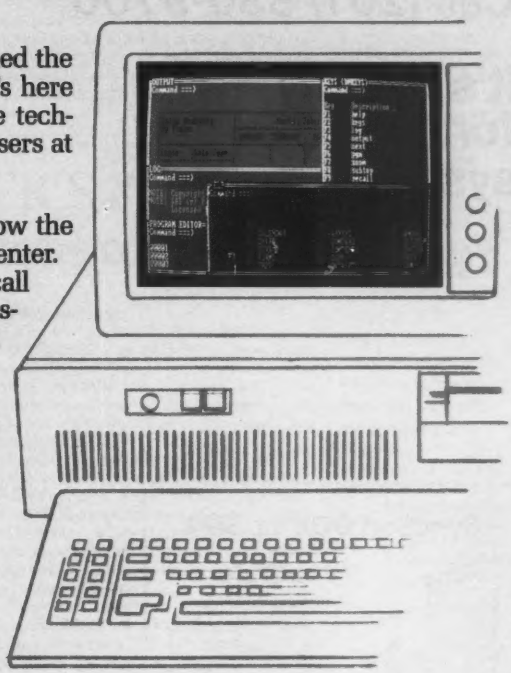

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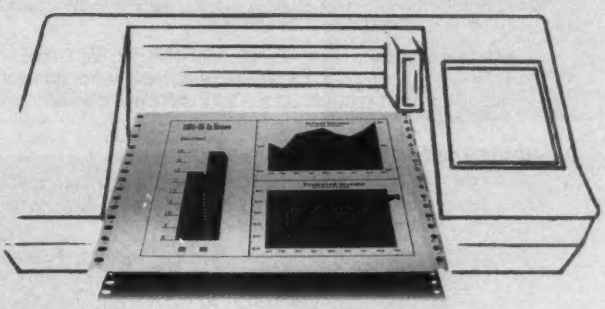

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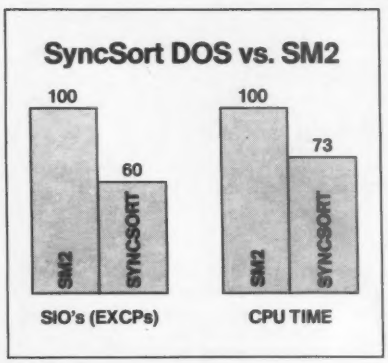

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SOFTWARE & SERVICES

SOFTALK
Charles Babcock

The continuing saga of SQL

Last week in this space, two critics of IBM's SQL discussed the language's limitations from the perspective of professionals responsible for application development in an MIS shop. As representatives of D & B Computing Services, Inc. and Applied Data Research, Inc. (ADR), the critics were also speaking as independent vendors who would like to sell fourth-generation languages and application development systems to MIS shops.

There is another chapter to that discussion, one that should embody more of the point of view of independent software vendors. What does SQL mean to these vendors, and why have so many of them— ADR included — rushed to announce support for SQL in their products if it lacks both statements to develop a full business application and ease-of-use features?

Stephen J. Gerrard, ADR's vice-president for product marketing — who discusses SQL in this week's In Depth section — addressed that point in a talk before a Digital Consulting Associates conference in July. Noting SQL's rapid emergence as a standard for accessing relational data base management systems, he called this development "a two-edged sword for IBM."

Indeed, one wonders whether the marketing professionals in White Plains and Armonk, N.Y., aren't as surprised as everyone else at SQL's sudden popularity. If we take the IBM Personal Computer as an example, IBM benefits early on by setting a standard and winning sales in the marketplace.

But once the standard exists, independent manufacturers use it to duplicate IBM's product and eventually to undercut IBM's position. It is this reverse swing of the standard, once established, that cuts IBM, and something

See **SQL** page 28

Babcock is Computerworld's *senior editor, software & services.*

Ideal 1.3 requires recompile

ADR users like product plans, lament 4GL obstacle

By Charles Babcock

NASHVILLE — When a State University of New York chose Applied Data Research, Inc. (ADR) over four competitors a year ago, it had the long-range goal of tying together mainframe and microcomputers in its four university centers.

"What ADR says is its direction — tying personal computers together and linking them to the mainframe — that's where we want to go," said Donald R. Izard, associate director of the technical support group at the State University of New York at Buffalo.

Izard was one of many attendees at the ADR Cadre users group meeting held last week who found something to agree with in the company's statement of direction.

The wide-ranging statement was made by ADR's Vice-President of Research and Development Joseph W. Farrelly in a keynote address, in which he also revealed the firm's plans for an accelerated product development cycle. Farrelly said ADR's new owner, Ameritech, has financed an expanded development effort, which includes bringing out personal computer and local-area network (LAN) versions of many of its mainframe products.

Cadre attendees also were impressed with the breadth of ADR's commitment to broadening its product line, integrating its fourth-generation language, Ideal, into its Librarian source-code manager and adding artificial intelligence to its Look series of mainframe monitors.

Some users, however, complained that new releases of Ideal required recompilation of applications before running them, making the releases harder to install than anticipated.

The Southern Baptist Annuity Board in Dallas has been a user of Ideal for three years. When it installed Release 1.3 of Ideal a few months ago, it found it had to recompile its 12 to 15 applications, according to Ruth Pankin, director of data processing.

"You have to recompile to pick up the improvements," agreed Jeff Williams, information center analyst with Watkins Motor Lines, Inc. of Lakeland, Fla., which is installing Release 1.3. When an Ideal program is able to call 50 other Ideal programs, they all must be recompiled to run together correctly, he said. The recompile step was less critical with releases prior to the 1.3 version, he said.

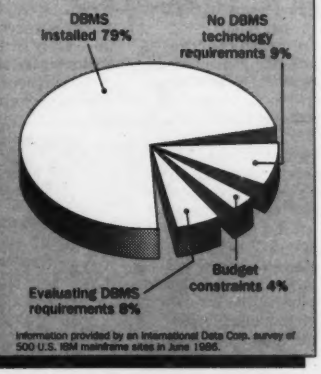
See **IDEAL** page 28

DATA VIEW

JEFF BABINEAU

No DBMS

Customers' reasons not to buy a data base management system



Information provided by an International Data Corp. survey of 500 U.S. IBM mainframe sites in June 1986.

CICS PC tool nears completion

By Eddy Goldberg

CHICAGO — Realia, Inc. is set to unveil RealCICS Oct. 6 at Info 86 in New York. The $995 RealCICS product, now in beta test at approximately 20 sites, will allow applications developed on a microcomputer to run on both personal computers and mainframes.

RealCICS, used in conjunction with Realia's Cobol compiler, allows programmers to develop, test, debug and compile mainframe CICS applications on an IBM Personal Computer XT or PC AT. This reduces mainframe resource contention and boosts programmer productivity, according to Realia spokesman Joe Koc.

"The main thrust is to save programming resources by developing and testing applications on a PC and then uploading the final product to the mainframe,"

See **CICS** page 29

INSIDE

Software International completes delivery of Masterpiece/**28**

PC/Focus from Information Builders is available to run on the Vaxmate/**28**

Computer Associates announces a release of its performance management utility, CA-Jars/CMS/**29**

NEW THIS WEEK

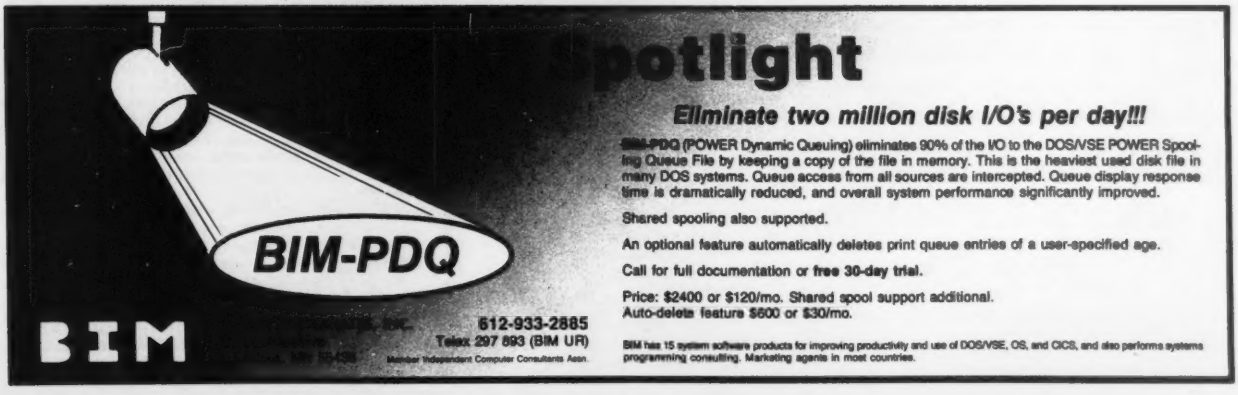
- Intel upgrades its IRMX86 operating system

- For more on this and other new products, see pp. 103-117.

INSTANT ANALYSIS

Sophisticated software will "integrate LANs into corporatewide information systems and, in many cases, will establish LANs as an alternative to the use of departmental processors."

— Joseph W. Farrelly, vice-president of R&D for Applied Data Research, Inc. to the ADR users group, Cadre, in Nashville



Ideal 1.3 must get recompile

From page 27

"Release 1.3 was not as clean as advertised," said Peter Charness, manager of systems development at Dylex Corp. of Toronto, an Ideal user for two years. Dylex had to recompile 60 programs in three applications. Preparation of the batch recompiles took two days, Charness said.

"If you have 500 or 600 programs, the exercise becomes far more complicated," he said.

ADR's Farrelly said Ideal was a rapidly evolving product with new releases introduced every six to nine months. When ADR changes the way Ideal interacts with IBM's CICS or makes other changes in the language for performance improvements, the recompile step is recommended, he said.

> ***'If you have 500 or 600 programs, the exercise becomes far more complicated.'***
>
> — Peter Charness, Dylex Corp.

Acknowledging that it was a bother, Farrelly said the customer gained the full performance improvements with the recompile step and gained only part of the improvement without it.

ADR is planning another release of Ideal, its second this year, in December. Some customers are not used to the rapid pace at which Ideal is evolving, he said.

ADR is banking heavily on the development of local-area networks to extend data processing to various departments and plans to provide products for that emerging market, ADR officials told the Cadre attendees.

"I think it's definitely going that way," said Todd R. Smith, senior data base analyst with Carolina Power & Light Co. of Raleigh, N.C. His company has purchased many personal computers during the last three years and is starting to tie them together into LANs, he said.

"We still believe corporate data processing is going to be mainframe-oriented" with personal computers tied into it, said Leo Cordeiro, manager of business systems in the MIS department of Codex Corp., a communications and LAN equipment supplier in Mansfield, Mass. ADR is one of the few major systems vendors to commit itself to that direction, Cordeiro said.

Daniel T. Golden, Ideal administrator at I.C. System, Inc. in St. Paul, Minn., said ADR's strategy did little to help his company. "I don't think we have any use for it right now. We're not big enough to get into tying LANs to mainframes."

John LaMora, project manager for the installation of ADR's Datacom/DB at Ralston Purina Co. of St. Louis, praised ADR's agreement to interface Datacom/DB with the Terradata relational data base hardware. "The biggest knock Datacom gets is that it can't perform fast enough. Now it's got power behind it to do relational processing that nobody else has got," LaMora said.

Accounting series for IBM complete

By Charles Babcock

ANDOVER, Mass. — The last two accounting applications in the Masterpiece series from Software International Corp. are available, completing the five-part series of software for IBM mainframes.

Accounts Payable and Purchase Order have been added to the integrated series, which includes General Ledger, Accounts Receivable and Fixed Assets Management, according to Robert Healy, senior vice-president of marketing.

Purchase Order features on-line, real-time data entry and inquiry. The status of an invoice, purchase order or receipt may be established at any time, he said.

An invoice entry is matched in real time to the purchase order, receipt and inspection information. Users can execute both the invoice entry and matching functions on a single screen, spokesmen said.

Available immediately, Purchase Order retails for $50,000 to $55,000.

The Accounts Payable application is an on-line system that provides cash requirements forecasting tools and centralized or decentralized disbursing functions, said James Stewart, product marketing manager.

Vendors may be shared across organizational units, and users may opt to consolidate vendor payments, he said.

Intercompany accounting allows posting of invoices across multiple divisions. All compensating intercompany entries are automatically duplicated and posted.

The package is integrated with Masterpiece General Ledger and provides on-line account validation and posting in summary or detail to the ledger, Steward said. It is available immediately at a price of $65,000 to $70,000, spokesmen said.

PC/Focus compatible with DEC Vaxmate

NEW YORK — Information Builders, Inc. has announced that its PC/Focus fourth-generation language is compatible with the Digital Equipment Corp. Vaxmate Personal Computer under the Microsoft Corp. MS-DOS 3.1 operating system.

Support for the Vaxmate includes full data and file transfer capabilities between Focus on the VAX and PC/Focus running on the Vaxmate PC, company spokesman Verne Sheidler said.

The Focus language is the same in both environments and allows Vaxmate users to access and extract data from VAX files or upload files to the VAX, Sheidler said.

PC/Focus retails for $798 to $1,295, based on volume.

SQL saga continues

From page 27

similar to the PC experience may be underway with SQL, Gerrard suggested.

"As proprietors of the standard, IBM is in an enviable position. But SQL is not that hard to duplicate," he commented at the conference.

The proliferation of products incorporating SQL since mid-July would seem to bear him out. Many of these products do not implement all the commands in SQL; a few products add commands, known as extensions, that are not in the IBM version. But each implementation contains enough SQL to provide the means to access and manipulate data in a relational data base.

If a vendor rigorously implements SQL in a Cobol application that is to run with a non-IBM DBMS, there is no reason why that application can't access data in DB2. Indeed, the rapid growth of Oracle Corp. and Relational Technology, Inc. can be explained in part by the fact that they are supplying not only relational technology at a time that the market is eager to test it, but also by the fact that they both employ SQL.

In addition to their own viable DBMS, Oracle and Relational Technology offer users the chance to practice their SQL skills while waiting for the day when DB2 is phased in as a production system.

But why can't the reverse be true? Isn't it possible for independent software houses to create DB2-compatible products, employing SQL as their data access language and safely fitting into the IBM mainframe world?

While there would be obstacles to overcome, they have been overcome before. When the era of distributed data base management dawns, it is conceivable that SQL will provide the standard that allows not only common access to different vendors' data base management systems but also access to systems on different brands of hardware. When that day comes, SQL will have earned its status as "a two-edged sword for IBM."

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Financial Technologies International, Inc

CICS developer revamp debuts

OAK BROOK, Ill. — Pansophic Systems, Inc. has announced Release 5.5 of Gener/ol, its interactive on-line application development and query system for CICS.

The fourth version of Gener/ol to be released in 18 months, it offers global support for Local Shared Resources and functional support for intercommunication facilities available through the CICS Multiple Region Option, spokesmen said.

The Local Shared Resources support is an additional VSAM file option, which reduces the number of VSAM strings required by Gener/ol and allows it to use less core memory.

The Multiple Region Option allows multiple CICS copies to share files simultaneously, spokesmen said.

Release 5.5 also offers interfaces to IBM's SQL/DS relational data base management system and Software AG of North America, Inc.'s Adabas. The SQL/DS interface allows Gener/ol users to create applications that use SQL access methods as well as Gener/ol access methods and format interface commands as familiar SQL statements.

Gener/ol is available immediately and priced at $49,000 for OS and $35,000 for DOS. The SQL/DS interface costs $7,000; the Adabas interface for DOS is $7,000 and $8,500 for OS.

Current Gener/ol users will receive Release 5.5 free of charge.

CICS PC pack rated by tester

From page 27

spokesman Koc said.

Ralph Skinner, a consultant to Toronto-based management consulting firm Woods Gordon, has been beta testing RealCICS for three months. Using RealCICS, Skinner took data from mainframe VSAM files and copied them onto an AT-compatible as indexed files.

He then took source code programs from the mainframe and moved them to the PC, where he recompiled them using RealCICS. The recompiled programs are executed in the RealCICS Runtime environment, where they read the indexed files downloaded from the mainframe.

Skinner said productivity on the micro is probably five to 10 times that of a mainframe, adding that he gives the product high marks so far.

The core of RealCICS is Realia Cobol, the company's $995 Cobol compiler, which takes CICS commands and translates them into Cobol, allowing full command-level CICS compiling, testing and execution on a PC.

RealCICS includes a Basic Mapping Support map generator, which produces the tables and Cobol copy members required for mapped-screen use.

A command-level Cobol preprocessor converts CICS, command-level Cobol programs to a form that can be compiled by Realia Cobol. Finally, a resource definition processor validates and converts CICS system macros to a form suitable for the PC.

CA-Jars/CMS release assists in chargeback

GARDEN CITY, N.Y. — Computer Associates International, Inc. has announced a release of its performance management and job accounting system, CA-Jars/CMS, for the VM operating system environment.

Release 6.0 provides users with a method for managing and billing the use of system resources. The system monitors the activity of each virtual machine and the use of selected programs, providing a basis for chargeback, according to Jeff Marinstein, product manager.

Added to the CA-Jars/CMS product is minidisk accounting, on-line budget inquiry and user interfaces, automated report generation and file backup. With the minidisk accounting facility, users may account for all VM-related disk use, again permitting user chargeback, company officials said.

Budget data access

The on-line budget query facility allows CMS users to access budget information. The information is available for each CMS user, each project and each CMS account. Data can be presented on a week-to-date, month-to-date or year-to-date basis, Computer Associates spokesmen said.

Release 6.0 also includes an on-line user interface for product customization. It allows system operators to set up or modify chargeback variables and data base security.

The automated report generation and file back-up facilities allow the user to define reports and then have the system produce them automatically on a daily, weekly, monthly or yearly basis.

Includes report writer

Release 6.0 includes a new report writer, CA-Jars Wizard, which allows a VM user to generate a desired report using English-like commands.

The release offers the capability for integrated reporting and chargeback functions with CA-Jars/MVS and CA-Jars/VSE.

Release 6.0 will be available for a one-time license fee of $15,000 at the end of October.

Disk storage, with an average industry growth rate of 40 percent a year*, is the fastest growing component of most IBM mainframe installations. And, personnel costs to manage disk storage are rising rapidly as well. The ASM2 Automated Storage Management software curbs expensive DASD growth and allows you to gain control of this valuable asset.

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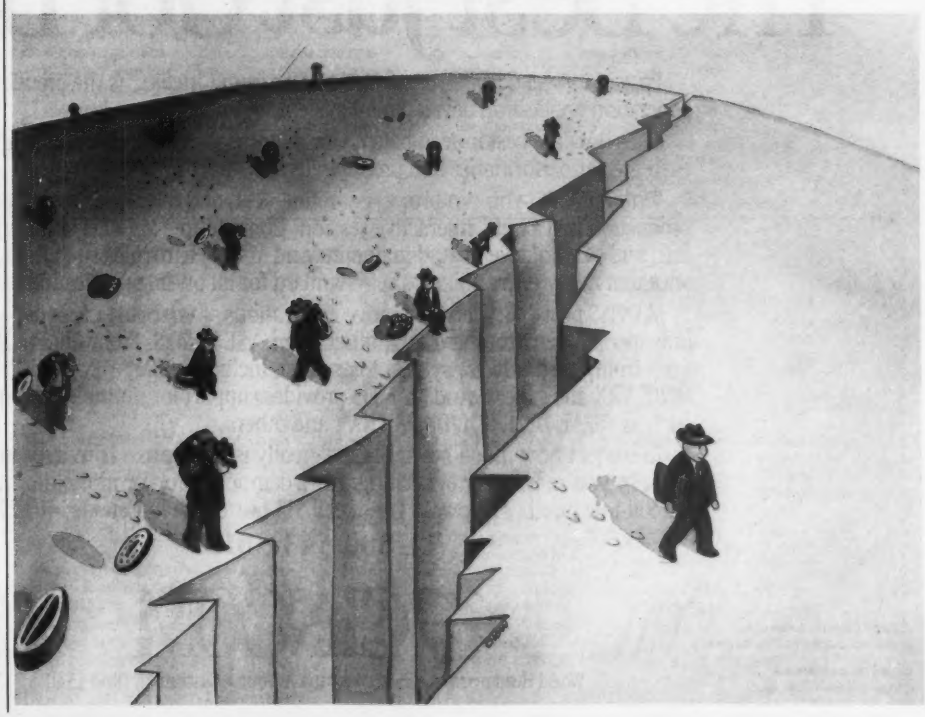

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COMMUNICATIONS

DATA STREAM
Walter Ulrich
and J. Mark Hayward

Is a translator in the house?

Remember when service bureaus and rekeying were the methods of choice for moving a document between incompatible word processing systems? The electronic document delivery and translation industry has grown up since those primitive times.

The goal is for information to be transmitted between any two systems in a form that can be viewed, printed, edited and retransmitted. Establishing an electrical connection that can pass bits is not enough.

You need translation that alters the characters within the information so that they can be handled by a receiving device, even if it is incompatible with the sending system. Translation as discussed here is an application-level communication requirement.

Documents generated on different office systems are almost always incompatible. One system formats documents differently from another. One printer has a character for "½," and one types "1/2." Minor differences in line length can cause a word wrap that destroys page appearance.

During 1985, we completed an extensive survey on customers' need for document translation. Forty percent of the companies surveyed recognized the need for document translation. When we probed deeper, we found that fully 90% of these firms really needed document translation but were unaware of

See **IS** page 32

Ulrich is president and Hayward is manager of the office systems division of Houston-based management and technology consulting firm Walter Ulrich Consulting.

Assist quells fear of LU6.2

Menu-driven program aids users in application writing

By Elisabeth Horwitt

LAGUNA HILLS, Calif. — A menu-driven program recently introduced by Network Software Associates, Inc. guides applications developers through basic LU6.2 commands, helping to overcome initial user phobia about the IBM Systems Network Architecture (SNA)-based programming language, the company claimed.

"Users are still scared of LU6.2," said Network Software Associates' director of marketing, Steve Chiu. "Assist helps them get used to the commands and takes them through writing an application step by step."

AdaptSNA LU6.2/Assist is used in conjunction with the vendor's existing LU6.2/APPC software, which implements Advanced Program to Program Communications (APPC) on the IBM Personal Computer. The Assist module provides a "comprehensive set of learning and development tools," said Zak Kong, company president. "The package includes a complete applications subsystem in addition to interactive learning and simulation facility and high-level language interfaces for each APPC verb."

Verbs are basic commands that are strung together to form an APPC program. For example, the verb "allocate" can be used to initiate a program on another system, Chiu said. "With Assist, you can write programs to talk to CICS on the mainframe, asking it to transfer records down to the PC," he said.

While Assist is not likely to make LU6.2 programmers out of business users, it "could be useful to end-user support organizations in large corporations that are accustomed to dealing with IBM PCs and have not been exposed to SNA, let alone LU6.2," said Atul Kapoor, vice-president of Haworth, N.J., consulting firm Kaptronix, Inc.

"The bigger question is where the IBM PC stands today in the arena of SNA-based distributed processing," Kapoor added.

See **ASSIST** page 32

Seven-channel line trial slated

By Peggy Watt

DANVILLE, Calif. — Following the successful completion earlier this month of a four-month, initial technology test, Pacific Bell will offer its Project Victoria technology, which splits a standard phone line into seven channels, in a market trial to be held early next year.

"We believe it's a milestone," said Michael Eastwood, executive director for new network applications. The Pacific Bell technology lets a single T1 line carry two 32K bit/sec. voice channels, a 9.6K bit/sec. data channel and four 1,200 bit/sec. low-speed data channels.

"The technology worked very adequately," Eastwood said.

The initial test involved some 200 Dan-

See **SEVEN** page 33

Satellite launch problem hangs over private companies

By Stanley Gibson

LAS VEGAS — In the wake of the Reagan administration's August statement that the space shuttle will no longer schedule commercial payloads, private companies and foreign agencies are scrambling to fill the satellite launching void.

According to Madeline Johnson, director of commercial space programs for the U.S. Department of Transportation, Martin Marietta Corp.'s Titan rocket, General Dynamics Corp.'s Atlas Centaur and Transpace Carriers, Inc.'s Delta all have successful launch records. These companies, along with entrepreneurial launch companies such as Space Services, Inc. and Amer-

See **SATELLITE** page 33

INSIDE

ITT releases service that allows E-mail between a variety of computers/**32**

NEW THIS WEEK

- CXI offers PCOX/5250 Remote for PC-to-minicomputer connections
- For more on this and other new products, see pp. 103-117.

INSTANT ANALYSIS

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ITT E-mail ties variety of systems

By Rosemary Hamilton

SECAUCUS, N.J. — ITT World Communications, Inc. recently introduced a communications service that will allow users of differing computer systems to send and receive electronic messages via the ITT telex service.

The Worldbridge service, which supports a number of common protocols, will be sold as a software package starting at $1,500. Users will also pay a per-message service charge, although that pricing has not yet been established, a spokesman said. The service currently supports hardware from IBM, Wang Laboratories, Inc., Digital Equipment Corp. and Hewlett-Packard Co.

ITT's announcement is similar to a service that Western Union Corp. has been providing for the past year. In conjuction with a number of third-party software vendors, Western Union offers interfaces to its Easylink public electronic mail (E-mail) service. Interfaces are available for the IBM Personal Computers and System/34, 36 and 38 as well as for the Wang VS systems and DEC VMS computers.

Western Union also recently added support for the IBM Professional Office System and Distributed Office Support System (Disoss). In these cases, Western Union has included the interfaces within its own Easylink service, so users do not have to purchase software packages.

The next step

"They all have to move into this area," said Helen Callan, a research associate at Link Resources, Inc. in New York. "Most of us have in-house electronic mail. The next step is to send it to the outside world."

ITT plans to sell the software directly to users. Residing on a host system, the software reformats an E-mail message so it can be transmitted over ITT's telex service. In order for the service to be effective, the receiver of the message must also have the ITT software installed. On the receiving end, the message is converted from the telex format to a computer-readable format.

According to an ITT spokesman, users can send messages to an individual's address on an in-house E-mail system. Users also have the option of sending a traditional telex message directly from their computer system.

The ITT service currently supports the following systems: the IBM System/34, 36 and 38, IBM systems running Disoss, the IBM 5520, IBM PCs, Wang VS, DEC systems running VMS and the HP 3000 series.

The Worldbridge software provides support for the IBM 3270 and 3780 protocols, IBM's Systems Network Architecture, asynchronous and bisynchronous protocols and the X.25 public network protocol.

Is a translator in the house?

From page 31

their needs. Some respondents did not immediately understand what was implied by document translation. Some assumed there were no solutions to their incompatibility problems.

More recently, we surveyed firms and found 70% recognized a need for document translation. The heightened awareness is primarily due to the increasing number of available products designed to meet translation requirements.

These products range from sophisticated mainframe-based alternatives to proprietary minicomputer translation packages and low-cost personal computer-based offerings. The two best-known products are mainframe-based systems marketed by IBM and Soft-Switch, Inc.

IBM's DIA/DCA products provide centralized document translation and transmission capabilities under IBM's communications system, Distributed Office Support System (Disoss). DIA provides nonrevisable document transmission. DCA provides the translation so that otherwise incompatible IBM products can communicate.

DIA/DCA enables users of IBM products such as Personal Services to send documents and messages to other IBM system users without regard for system-to-system compatibility. Users can also use DIA/DCA to send documents between IBM computers and other vendors' systems that now support the protocols.

Digital Equipment Corp., Data General Corp. and Hewlett-Packard Co. are among those that now support DIA/DCA formats.

Another available solution is a group of IBM mainframe-based products from Soft-Switch of King of Prussia, Pa. Soft-Switch's system provides revisable and final-form document exchange among several major office automation systems, including IBM's Professional Office System, DEC's All-In-1 and Wang Laboratories, Inc.'s Wang Office. The only drawback to Soft-Switch's products is that an IBM mainframe must be used as a go-between in all document exchanges.

Several minicomputer companies offer their own or third-party software packages that translate a spreadsheet or a word processing document generated by an IBM Personal Computer application to a format that can be handled by mini software.

DG, for example, provides a facility that converts documents created by software such as Wordstar by Micropro International Corp. and Ashton-Tate's Multimate so that they can be sent to another user on DG's Comprehensive Electronic Office system.

Finally, there are smaller, stand-alone translator boxes and PC software packages offered by such companies as Keyword Office Technologies, Ltd. and Interpreter, Inc.

Keyword recently announced a series of IBM PC-compatible translation packages, each of which, for $500, provides translation between pairs of word processing systems.

The next crucial steps toward the goal of a universal translator will be the perfecting of text translation and the development of graphics translation. Another hurdle is the development of universal directories.

These tasks will take time to accomplish. Meanwhile, it behooves communications managers to educate themselves on their users' document translation needs and to keep abreast of technological developments that will better fulfill those needs.

Assist quells fear of LU6.2

From page 31

"Right now, LU6.2 is caught in a vicious circle, where you need products out there to convince businesses to use it, but you need enough of a market to make it economic for vendors to develop the products," Kapoor said.

LU6.2 is a far more efficient basis for a micro-to-mainframe link than the 20-year-old 3270 protocols, Chiu said. "File transfer is cumbersome with 3270, since it uses slow, half-duplex communications. Also, file-transfer applications that are written for 3270 are incompatible with each other, while applications written for LU6.2 will work together. Eventually, this will mean that users won't need to know which host they are accessing for their records."

AdaptSNA LU6.2/APPC and LU6.2/Assist can be used on any IBM PC, Personal Computer XT or AT or compatible with 256K bytes of main memory and an IBM PC-DOS 2.0 or later version. To communicate with another computer, the PC also requires a synchronous data link control communications adapter and synchronous modem.

LU6.2/Assist costs $345, and the LU6.2/APPC software costs $150.

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Satellite launches in short supply

From page 31

ican Rocket, Inc., will provide alternatives to the shuttle.

Johnson spoke at a roundtable discussion of launch issues at the Satellite Communications Users Conference held recently.

She said the administration looked at the backlog of scheduled flights on the shuttle and decided it would not be able to handle it when the shuttle resumes launching. Hence, it chose to encourage private companies to adapt existing rockets for commercial satellite launches.

However, John E. Koehler, president of Hughes Communications, Inc., said launch technology is too expensive and complex for the entrepreneurial companies to master. "It costs $1 billion to build a rocket that works," he said. Koehler said that Hughes is looking at launch alternatives, including the Soviet Union's Proton rocket.

However, Robert Brumley, chairman of the commercial space working group of the U.S. Department of Commerce, nixed that notion by stating that the government would never allow a U.S. satellite to be launched from Soviet soil because of technology transfer considerations.

Chinese Long March rocket

In contrast, the Chinese Long March rocket, in which Koehler also expressed interest, faces far fewer barriers, according to Brumley, because of China's current favorable trade status. The Chinese have said they might be willing to launch their rocket from Hawaii, thus circumventing technology transfer considerations, Brumley said.

Koehler added that he was also looking into the Japanese H1 and H2 rockets as launch vehicles for Hughes satellites.

Richard R. Colino, director general of the International Telecommunications Satellite Organization (Intelsat), a 110-nation consortium, said at an earlier program that Intelsat, like Hughes, has been actively discussing launch possibilities with French Arianespace, General Dynamics, Martin Marietta Data Systems, Inc., China, Japan and the Soviet Union.

Colino laid the blame for launch problems at the door of the U.S. government. "The U.S. space program was misguided. The constant push to the shuttle gave short shrift to the disposable rocket program."

But he claimed Intelsat is taking advantage of launch problems to improve Intelsat 5 and 6 by increasing the transponder space of Intelsat 5 and Intelsat 6 to accommodate the move of users to very-small aperture terminals (VSAT). Using smaller terminals will allow users to reduce costs by 50%, he said. "We think business users will go into VSATs more and more, especially in large, developed countries," Colino said.

Koehler said Hughes was disappointed in the government's decision to eliminate commercial launches from the shuttle's agenda. The shuttle's prolonged lull, Arianespace's recent setbacks and the delay in getting other vehicles in operation creates a bleak launch picture. "The launch situation is just awful between now and 1990," Koehler said.

Seven-channel line trial slated

From page 31

ville residents, most of them using the Victoria technology at home, but also included city officials and city council members. A Victoria box was installed on each of their telephone lines, and each tester used a Macintosh Computer contributed by Apple Computer, Inc. for the trial.

Pacific Gas and Electric Co., Dow Jones Information Services and Chronicle Videotex, Inc. offered on-line data services for users to call as they tested the technology, and Bank of America offered home banking services.

City Council Member Dick McNeely said the experiment was "a glimpse of the future" of telecommunications. "It was my introduction to the kinds of services available with computers and phone lines," he said. As a public official, he appreciated the on-line forum, set up for the test, that allowed citizens to post questions, gripes and suggestions. In fact, the city is considering offering a permanent electronic bulletin board for all residents to call.

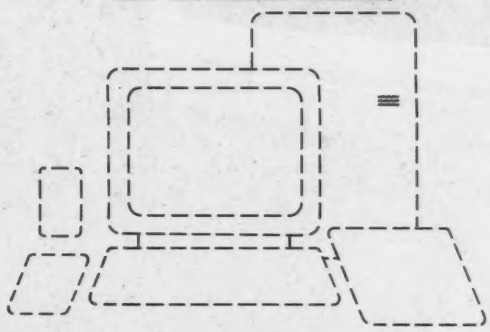
"The technology was very smooth, though we had a kind of rough start," said Steve Lake, a Danville city engineer, who used a Project Victoria connection at work. "Some of the communications didn't work very well on the Macintosh, especially those that tried to use the Macintosh as a terminal, because of its graphics features." But those that took advantage of the graphic interface worked well, he added.

The next trial will involve more commercial uses because it will be available as an optional service under a temporary, test-period tariff that is still pending, Eastwood said.

Customers will use their own computers, so a variety of customer premise equipment will be involved. This phase will help Pacific Bell evaluate Project Victoria's market appeal and potential rate structure. Pacific Bell has not disclosed where the next test phase will take place, but a source told *Computerworld* it will be held in the Mountain View, Calif., area in January.

"The technology test seems to be the easy part," Eastwood said. "There's an opportunity for many new types of applications now. We look for Victoria to be an adjunct to the company, a growth job."

Think.



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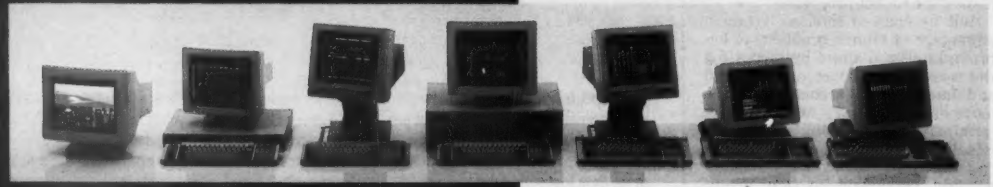

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MICROCOMPUTERS

MICRO BITS
Daniel J. Rosenbaum

Opening up Pandora's box

Compaq Computer Corp. unleashed some mighty forces earlier this month with the introduction of its Deskpro 386. Were I creating code names, I'd have called this one "Pandora," because it's the box that's going to cause no end of trouble.

The company stole a march on the personal computer world by introducing the first general-purpose computer based on the impressive chip from Intel Corp., the 80386.

That's good news for users — lots more power for a little more money is always good news. But is it really good news for Compaq?

The 386 computer is not just another PC; its power and speed represent an important leap forward into the minicomputer arena, and that's precisely where the trouble begins.

Rod Canion, president of Compaq, told the hordes assembled at the Deskpro 386's splashy New York send-off that his company was basing its hopes for the machine on the same principal that has traditionally driven the market: Give enough people enough computing power and some significant number of them will always want more — assuming the price isn't ridiculously out of line.

Sure it works. Why else would people who were once happy with Digital Research, Inc.'s CP/M, and who didn't know the difference between Lotus and saffron a couple of years ago, be moan-

See **OPENING** page 36

Rosenbaum is executive editor of "Wiretap," a computer-industry newsletter published in Morristown, N.J.

AI languages for Mac, IBM PC, VAX introduced

By Peggy Watt

SANTA BARBARA, Calif. — Expertelligence, Inc. recently announced it will sell an IBM Personal Computer version of the artificial intelligence development language Prolog and versions of LISP for IBM, Apple Computer, Inc. Macintosh and Digital Equipment Corp. VAX systems under agreements with two French companies.

Prolog II was developed by the French firm Prologia and will be available from Expertelligence in November, said Richard Messier, vice-president of marketing.

The firm released another version of the language, Exper-Prolog II for the Macintosh, in June; it was priced at $495. Messier said the version for IBM PC and compatible systems will be priced similarly and has an interface that uses Macintosh-like windows and pull-down menus. It does not require a mouse but needs 640K bytes of random-access memory. A hard disk is recommended.

Prolog II is an interpreter and includes real numbers, string manipulation and advanced process control and will be packaged with a tutorial manual, according to Expertelligence.

The product will be a mid-range Prolog product, positioned between Borland International, Inc.'s recently released Turbo Prolog with a compiler, priced at $99.95, and the $795 Arity/Prolog Compiler and Interpreter from Arity Corp.

"Borland is bringing to the world what AI is," Messier said. "It's more of an overview. Prolog II has all the tools for standalone applications." He added that Expertelligence will also release Le-Lisp, another AI language product from ACT Informatique of Paris, in the U.S. early next year.

The two products join an existing Expertelligence product line that includes Prologo, a Prolog interpreter written in Logo; a separate Logo implementation, Experlisp, a LISP interpreter; two expert systems; and a file transfer system.

NEW THIS WEEK

- CMS offers 8 page/min laser printer
- AT&T introduces Targa 8 graphics board

For more on these and other new products, see pp. 103-117.

INSTANT ANALYSIS

"Anybody who announces a 386 PC at this juncture, before IBM makes its move, should have their head examined."

— Marty Gruhn, vice-president of The Sierra Group, on Compaq Computer Corp.'s Deskpro 386

Televideo offers enhanced LAN

By Peggy Watt

SUNNYVALE, Calif. — Televideo Systems, Inc. has announced enhancements to its local-area network (LAN) server, the Televideo Personal Mini, that allow it to connect to other LANs and larger systems.

The new "backbone" link enables a server to connect with as many as eight other servers and also provides bridges to IBM Systems Network Architecture, Token-Ring or other Netbios networks and CCITT X.25, said Ron Nakashima, Televideo's systems product marketing director. The $7,495 Personal Mini servers also require the new PM/Link Network Interface card, priced at $995, in order to communicate with each other.

Personal Mini LANs run under PM/

See **TELEVIDEO** page 37

First CD-ROM disk produced to High Sierra standards

By Douglas Barney

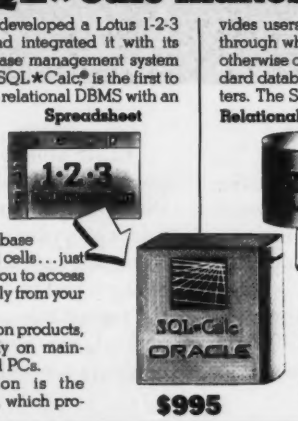
The compact disk/read-only memory (CD-ROM) industry recently moved one step closer to data file standardization with the completion of the first disk that follows the logical format standard proposed by the High Sierra Group, an ad hoc committee of 13 corporations.

The disk was developed by 3M Corp.'s Optical Recording Project in conjunction with Reference Technology, Inc. of Boulder, Colo., which actually put the data into the High Sierra format. 3M, of St. Paul, Minn., and Reference Technology earlier this year announced a nonexclusive pact to prepare and replicate CD-ROM disks.

See **CD-ROM** page 37

Oracle's SQL★Calc makes a relational DBMS as easy as 1-2-3.

Oracle Corporation has developed a Lotus 1-2-3 compatible spreadsheet and integrated it with its ORACLE® relational database management system (DBMS). The new product, SQL★Calc,* is the first to combine a mainframe-class relational DBMS with an easy-to-learn and familiar PC spreadsheet user interface.



SQL★Calc is designed for 1-2-3 users who've run out of memory, flexibility and patience. SQL★Calc allows you to put SQL database commands into spreadsheet cells... just like formulas. This permits you to access large amounts of data directly from your spreadsheet.

Like all Oracle Corporation products, SQL★Calc runs identically on mainframes, minicomputers and PCs.

SQL★Calc's foundation is the ORACLE relational DBMS, which provides users with a complete set of SQL commands through which they can create, retrieve, modify and otherwise control their data. SQL is the industry standard database command language for large computers. The SQL commands available in ORACLE are identical to the SQL commands in IBM's premier mainframe relational DBMS products, SQL/DS and DB2.

Built on this powerful DBMS foundation is a Lotus 1-2-3 compatible spreadsheet that allows users to put SQL commands into spreadsheet cells in the same way as they enter formulas. When a SQL command for data retrieval is entered into a spreadsheet cell, information is automatically retrieved from the database and placed into the spreadsheet. SQL★Calc also permits users to modify the database–and even create new database tables–directly from the spreadsheet.

SQL★Calc is easy to learn because its menu and command structure are compatible with those of Lotus 1-2-3. And SQL★Calc's ORACLE DBMS requires no supplement: It is vastly more powerful than the database components of 1-2-3, Symphony, Framework, dBase II, dBase III, or any other PC DBMS.

SQL★Calc is available immediately for IBM PC/XTs and ATs for $995.* SQL★Calc will soon be available on a wide variety of systems, including IBM mainframes, DEC, DG, and other superminis, and most UNIX systems.

For further information, or to order your copy of SQL★Calc, call 1-800-345-DBMS. Or write Oracle Corporation, Dept. CS, 20 Davis Drive, Belmont, CA 94002.

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Opening up Pandora's box

From page 35

ing today about "only" 640K bytes of memory or 33M bytes that can be formatted on a hard disk in a single volume?

But as the boundaries of Microsoft Corp.'s MS-DOS are stretched, and as new versions are prepared that can handle more storage and more memory, an important event is occurring: MS-DOS is starting to encroach on grounds staked out by larger operating systems with significant installed bases.

An installed base means an entrenched interest. Compaq's next big battle may not be technical so much as political.

The great white whale in microcomputing is a windowed, multitasking operating system — one that will let the user do five or six things concurrently, stashing each task in a separate part of the screen. Microsoft is reasonably close to doing this with Microsoft Windows and the widely rumored MS-DOS 5.0.

All this panting after multitasking is a little bit amusing. There's already a small-system, multitasking operating system in wide use. It's called Unix, and desktop minis that run it are not as rare as Compaq might have you believe.

Of course, MS-DOS users have heard about Unix. They've heard it's too big, that it eats memory, that it's user hostile and that only a technocrat could love it. But MS-DOS users generally fail to realize that they are closer to using it than they think.

Every release of MS-DOS creeps closer and closer to Unix. Hierarchical path names are taken from Unix. Piping? I/O redirection? Batch files? Command flags? All of them are from Unix.

All the power of a Deskpro 386 — multimegabyte addressing, multiuser capability and multitasking — requires a big operating system, much bigger than MS-DOS. For those big machines, Unix is there today. MS-DOS is not. Unix is flexible enough that it can run MS-DOS programs. So why bother with a new MS-DOS?

Unix is originally a product of AT&T; no one can write a version of it without AT&T's permission. MS-DOS is written specifically for IBM-compatible microcomputers with IBM's blessing.

That's why there's a Windows and an MS-DOS 5.0. The IBM-compatible world wants more power but is not about to give AT&T the keys to its empire. In fact, IBM is bending about as far as it possibly can to avoid giving its users a good, usable, portable form of Unix.

Does that mean Unix is going to just fade away in the face of Compaq and Microsoft? The number of Unix installations argues strongly against that.

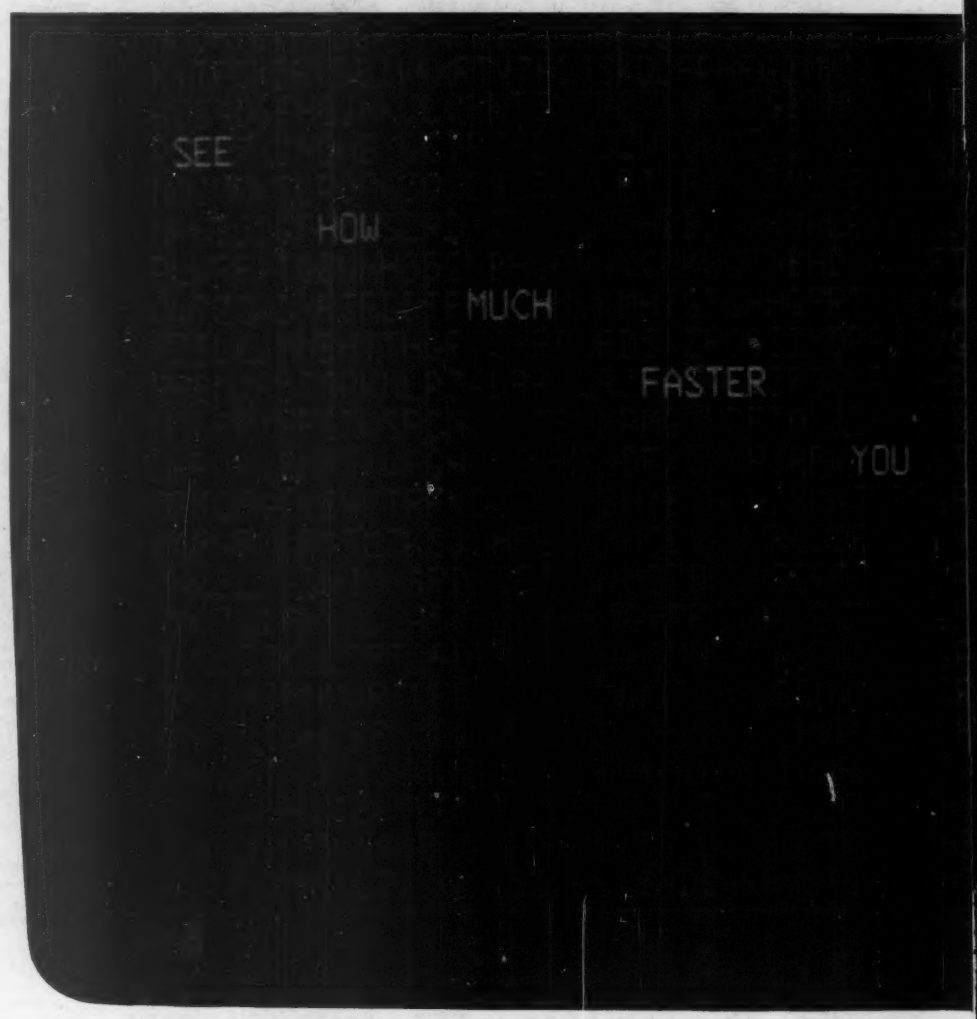
While Unix is not the darling of the MIS shops, it is the operating system of choice in many technical and engineering installations, and that demand appears to be fueling a growing number of Unix licensees.

There are certainly problems with Unix. MS-DOS is faster (although there's no way of telling whether that will be true on larger machines) and is better at screen painting. That's not insignificant, because it makes programs more comfortable to use.

Canion plainly realizes the power of his new machine and recognizes the dynamite he's playing with. He hopes the Deskpro 386 will come in the back door the same way his original Portable did and that the $9,000 top price will indeed make it possible to bypass the MIS shop in many cases.

But MIS has smartened up in the last four years, and the Deskpro 386 is just too big to fit quietly through that back door.

That is the central issue the Deskpro 386 will force the industry to face: Just exactly who is running the show? The large group of end users with their MS-DOS or the administrators with their Unix, VM and MVS?



An IBM Color Display.

It can really boost an operator's efficiency. That's what REJIS found out. REJIS is the Regional Justice Information Service in St. Louis.

This information service is a trendsetting, government criminal justice network linking 120 different agencies to a central computer.

REJIS quietly initiated a pilot program using IBM 3179 Color Displays. The units were tested under everyday conditions. Default colors were used, so no software changes had to be made. The quiet test turned into a smashing success.

End users were amazed to see how data popped and how mistakes

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CD-ROM meets specs

From page 35

"This is the first time that 3M has mastered a disk to that proposed standard," said Mike Befeler, director of strategic marketing for Reference Technology.

Although CD-ROM players and disks are currently available and work with most major microcomputers, the market has not taken off because of the lack of an industry-wide standard file format.

"The problem with CD-ROM as a business is that there is not enough momentum. The question is what will make it go, and the answer is good applications," said David H. Davies, manager of 3M's optical recording project.

According to Davies, the standard format will increase the number of applications available on CD-ROM disks.

Unmodifiable disks

Also, although CD-ROM disks can hold up to roughly 550M bytes of data, once the disk is formatted and filled with data, it cannot be modified.

"It is like publishing a book," Befeler explained. According to Davies, erasable CD-ROM disks will not be in widespread use until 1990.

The proposed standard was announced at the June National Computer Convention in Las Vegas.

The High Sierra proposal calls for a defined volume table of contents and directory structure for CD-ROM disks.

Such a structure would allow the CD-ROM data to be read on a variety of systems, including CD-ROM players now in use.

'De facto standard'

"It is a de facto standard because all of the major players are conforming to it," Befeler said.

The disk prepared by Reference Technology contains data from the U.S. Department of Commerce's Census Bureau and includes 1980 demographic census data for all five-digit zip codes as well as 1983 county business pattern statistics.

In addition to 3M and Reference Technology, the High Sierra Group includes Digital Equipment Corp. and Microsoft Corp.

Televideo LAN out

From page 35

Netware, an OEM version of Novell, Inc.'s Advanced Netware, using a star topology that gives each workstation a direct connection to the server. Linking servers of several LANs allows those clusters to communicate and share files, according to Nakashima.

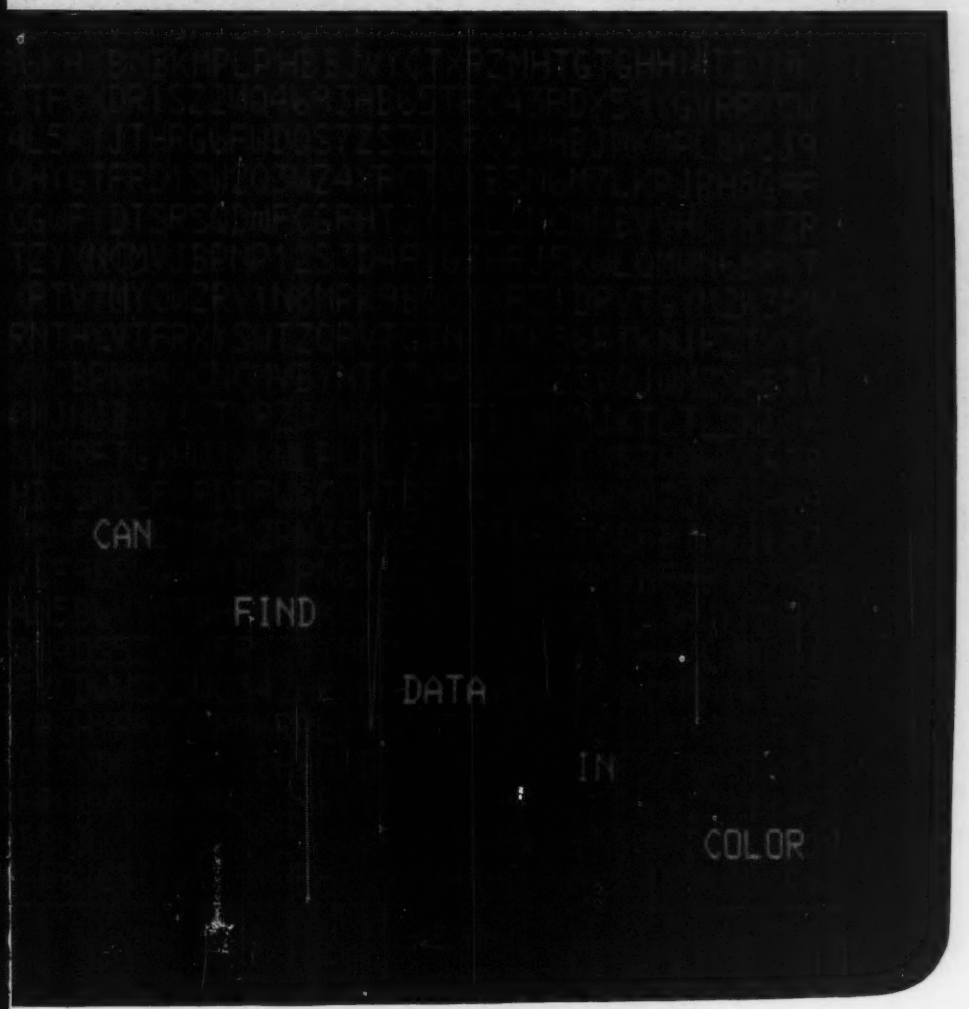
The software enhancements, including bridge capabilities, will be available in October, with a discount for existing customers, Nakashima said. Televideo expects the primary buyers to be existing customers who want to tie together their clusters of LANs.

Although individual work groups may be linked on their own LAN, they nonetheless may occasionally need to share data with other work groups that have their own cluster, he added.

PCs serve as nodes

The Personal Mini server, which is built around dual Intel Corp. 80186 and Z-80 microprocessors, has been on the market for more than two years. IBM Personal Computers or compatible workstations can become nodes on the Personal Mini network with a connection of RS-422 cable and a $199, half-slot network adapter card.

The PM/Netware software includes a multiuser file system, record and file locking, four levels of data security and print security. PM/Netware 2.0 supports application programs developed for Microsoft Corp.'s MS-DOS 3.1 and IBM's Netbios. Hard disks and tape backup systems are also available.



were easier to catch.

Soon, REJIS end users everywhere wanted IBM 3179 Color Displays. The result — IBM color displays are now being placed throughout the REJIS network.

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Executive Report

Edited by Janet Fiderio

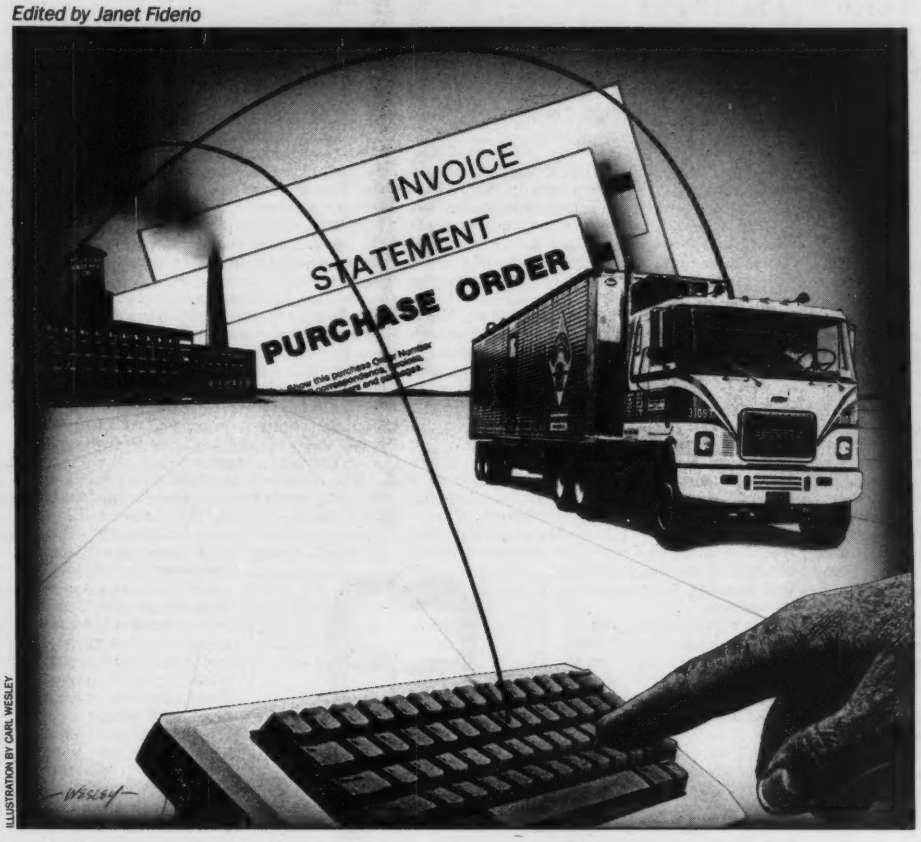

ILLUSTRATION BY CARL WESLEY

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Software vendors scurry to offer users cheap alternatives to custom systems/62

Electronic Data Interchange

Standard's momentum grows as users realize benefits

By JOANNE KELLEHER

Two years ago, only a few of Jim Bridges' customers had ever heard of Electronic Data Interchange (EDI). "Now," says Bridges, director of MIS at United Refrigerated Services, Inc., a large food warehousing company based in Atlanta, "we are getting calls every other week about it."

EDI is the direct electronic transmission of standard business forms such as invoices, purchase orders and shipping notices. Its growing popularity among suppliers and buyers is due to the emergence of a broadly accepted standard, ANSI X.12, and the development of relatively inexpensive software and services to support it.

United Refrigerated has been exchanging EDI documents for more than a year with four of its major customers. It uses a commercial software package, Translator 38, by McDonnell Douglas Electronic Data Interchange Co. of St. Louis, running on an IBM System/38, to send and receive documents in the ANSI X.12-compatible Warehouse Information Network Standard.

As of late, three dozen to four dozen additional United Refrigerated customers have expressed an interest in EDI.

Although Bridges does not expect that a total conversion to paperless communications is likely in the immediate future, he does expect customer demand to become strong enough in the next year or two to make EDI capability "a must of doing business."

If that projection is correct, MIS and DP executives have only a short time to rehearse a new role.

According to Victor S. Wheatman, senior consultant with the Mountain View, Calif.-based market research firm Input, as recently as one year ago information systems personnel exhibited a very low knowledge level about EDI and what its implementation is likely to entail.

Even now, Wheatman says, most of the impetus behind electronic document transfer comes from other parts of the organization, "usually the purchasing department or upper management."

However, neither upper management nor purchasing are technically equipped to respond to customer questions, although they may be the first to sense the cost-saving potential of EDI or to hear customer requests for this kind of interface. Further, they are unable to make technical

When an industry discovers EDI's benefits — reduced paper handling costs, error elimination and lowered inventory requirements — it pushes suppliers to adopt the technology.

Kelleher is a Boston-based free-lance writer who specializes in high technology.

EDI use grows as benefits emerge

Continued from previous page

decisions about how to implement the system and how, or if, it should be integrated with existing information systems.

"MIS managers should be prepared to take a more active role in customer relations than they are probably used to," says Steven Olson, DP director of Barry & Sewall Industrial Supply Co. of Minneapolis. "EDI is a technology that requires coming out from behind the glass doors, out of the air-conditioned rooms, to shake hands with customers."

It is also a technology that many users and analysts foresee as having great strategic implications, particularly as new transaction sets and applications are developed that will involve more departments of the company and draw together previously discrete streams of information.

This means that MIS executives will have to step away from the technology and will have to become more involved with the macro issues of the business.

At Rockwell International Corp.'s Automotive Operations Division in Troy, Mich., for example, systems manager Thomas Zelinski wound up with the title of director of materials control after working with both the materials and marketing departments on EDI implementation.

"Now," he says, "as we move further out and start to get our supplier community involved, MIS will be working quite a bit with purchasing."

The electronic exchange of formatted business information between organizations is not new. Companies large enough to make the investment worthwhile and powerful enough to influence their suppliers to complete the connection have transferred documents in this paperless fashion for 10 to 15 years.

But what has made EDI a manageable reality is the growing momentum behind ANSI's X.12, which produced the much-needed transmission control, transaction format and content standards.

In fact, a significant number of industry associations have moved to cast their lots with ANSI's X.12 standard. "There must be 30 industry groups now either planning or already beginning to implement the X.12 standard," says J. Joseph Miller, director of retail standards and technologies for the National Retail Merchants Association (NRMA) in New York.

The NRMA, itself, is currently preparing documentation and training materials based on a year-long EDI pilot project involving two major California retailers, Macy's, Inc. of San Francisco and Carter Hawley Hale Stores, Inc., based in Los Angeles, and also including five apparel manufacturers.

Separate groups in the apparel and textile industries are also working toward the development of subsets of the X.12 EDI standard that will automate not only ordering and billing but also the transmission of fabric specifications.

According to Bob Canis, manager of customer communications at LTV Steel Co. in Cleveland, once a major industry realizes the benefits that can be achieved with EDI in terms of reduced paper handling costs, error elimination and lowered inventory needs, it pushes its suppliers to adopt the technology. "Then it starts to grow and feed out to the suppliers of those suppliers."

Due to its avid interest in just-in-time manufacturing, the automotive industry has been a major catalyst in the recent push toward widespread adoption of EDI, according to Canis, who is a member of the communications project team for the Automotive Industry Action Group (AIAG), a coalition of auto makers and suppliers formed in 1981 to advance industry productivity.

Of all of the trade groups involved in EDI standardization efforts — a list that now includes

Continued on next page

User Profile

Ford's drive toward compatibility

By ELISABETH HORWITT

The Electronic Data Interchange (EDI) standard is a key component in Ford Motor Co.'s drive toward a uniform communications system that will link both internal divisions and outside suppliers. But the auto giant has encountered some obstacles on the road to EDI implementation, notably its own recently completed EDI network.

The culmination of 20 years of effort, Ford's current system incorporates internally developed protocols that were tailored for the company's communications needs. Now upper management has told various divisions that they will have to exchange these protocols for an emerging standard that was designed for the automobile industry at large, not just for Ford.

The burden of the MIS executive's message: However painful the initial conversion effort, the improvements to Ford's internal and supplier communications make it all worthwhile. But before it can enjoy the future benefits of standardized EDI, such as just-in-time production, Ford must overcome two obstacles that currently loom large on its horizon.

Ford's Richards

One is the expense and effort involved in converting an already existing system to the standard. "Converting to the new protocols will be less difficult for suppliers than for us," says Charles Richards, Ford's supervisor of system development in purchasing and supply. "Many of them are using third-party software that reads the contents of documents from each manufacturer into their own systems. Converting to the standard will probably mean just loading in a new floppy."

In contrast, manufacturers like Ford must make major changes to the systems that generate the documents in the first place. The fact that standards groups have not yet released a number of the document formats has forced Ford's systems people to implement each set of protocols as it becomes available.

Early in 1986, Materials Release Document protocols were the only portion of the EDI standard that had been officially approved by the Automotive Industry Action Group (AIAG). Ford's basic manufacturing divisions and its 1,500 suppliers started using that standard in April, rather than delay until later this year when the AIAG is expected to approve protocols for a related document, the Shipping Release.

According to one source, the Shipping Release and Materials Release conversions could be handled much more efficiently as one project, because both documents make use of the same data. Doing the conversions separately may delay the overall project a year, he adds.

This scenario is likely to be repeated each time a new set of protocols is released, but Ford has chosen not to wait until the AIAG has approved the entire EDI standard — a process that is likely to take another year or two.

Even with a full set of protocols available, "converting to the new standard is a major job, particularly since the old format has no fields for some of the data needed in the new one," Richards says.

Discrepancies between the existing, internally developed system and the new protocols have complicated the standardization project in more ways than one, notes Lockwood Lyon, a consultant at Dearborn, Mich., consulting firm Cyber. Lyon began working on the EDI conversion project at the Ford Body & Assembly Division in January. According to Lyon, the AIAG format requires, on the average, an extra 1,800 characters per part record, used for control information, headers, trailers and the like. This tripled the amount of data handled by Ford's systems, thus causing serious delays in transmissions to suppliers.

The first bottleneck occurred when the Materials Control System III (MS III), a companywide information processing system residing on a group of IBM 3080 series mainframes, passed on the day's materials requirements to the Supplier On-Line Management Information System (SOLMIS). An electronic mail center residing on a Burroughs Corp. mainframe, SOLMIS processes Ford's materials and parts requirements and sends them on to suppliers.

When Ford was using the old materials release format, it used to take an hour to transmit a day's worth of supplier information via the 4.8K bit/sec. pipeline between MS III and SOLMIS, Lyon says. Using the new standard with its greater overhead, total transmission time jumped to three hours. "MS III processed the data at 6 a.m. — it took about six minutes — and then began transmitting it to SOLMIS," Lyon reports. Under the new system, suppliers were getting their releases at 9 a.m., which was too late, since they wanted their trucks to be on the road by 8 a.m., he explains.

Lyon's group took two approaches to speeding up transmission time. First they eliminated part of the AIAG format's overhead, even though this violated the standard. And second, they dispensed with the 4.8K bit/sec. link. Instead, data is loaded from the MS III system to tape and walked over to the SOLMIS, where it is loaded. "The whole thing takes about 15 minutes," Lyon says.

Ford will shortly install three 19.2K bit/sec. links between MS III and SOLMIS, so that data can once again be transmitted electronically.

A different characteristic of the new standard has slowed down transmissions between SOLMIS and the suppliers, Lyon says. Because the AIAG format is designed to meet a wide variety of user needs, it makes use of variable-length fields.

This means that documents have to be processed character by character, in contrast with fixed-length fields in which data can be processed a block at a time. Ford's Burroughs programmers had to write a machine language program to process the data, since the former Cobol-based program was not designed to process characters efficiently.

If all goes according to plan, Ford's basic manufacturing divisions, along with its 1,500 production parts suppliers, will have the AIAG materials release format in place by the end of 1987. "That's pretty ambitious, but we still may get it done in time," Richards says. Conversion to the Shipping Release standard will begin as soon as it is finalized and "will not involve too many major changes — we hope," he notes.

The next major stage will be standardizing purchase orders, requests for quotation and other documents exchanged with the approximately 6,000 suppliers of nonproduction parts.

"We've used EDI for almost 20 years, first as a way to keep track of where supplies were on our fleet of railroad cars," Richards says. "It is one link in the electronic communications chain that will help us speed up the process of turning information around. It'll be a lot of work, but worth it." ■

Horwitt is the senior editor, communications, for Computerworld.

Continued from previous page

not only the transportation industry and retailers but also the metals, electrical, chemical, grocery and office products industries — the automotive industry has both the widest realm of influence and the greatest incentive for pushing paperless transactions.

The auto makers, which have been requiring some of their major suppliers to communicate with them electronically for up to 15 years, are well aware of EDI's advantages. They are eager to extend the practice throughout their entire supplier base for transactions that include not only purchase orders, shipment notices and invoices, which are the currently the most common forms of exchange, but also production specifications, requests for quotes and payments. When that happens, they estimate, savings could easily amount to $200 per vehicle.

"Multiply that by the five million vehicles produced annually," AIAG staff member Mike Gerus notes, "and it is easy to understand why we are acutely interested in getting all of our suppliers, direct and indirect, involved."

Until recently, it was costly and time-consuming for suppliers to accommodate customers by gearing up for electronic data exchange, because it required an investment in a terminal and the development of special translation software to interface with a customer's proprietary format. Even for large suppliers like Rockwell or LTV Steel, maintaining separate systems to communicate with individual customers was often a headache.

"We're starting to convert to the standard format," Rockwell's Zelinski says, "but what we have had until now are more than 100 different program modules to deal with companies and their various divisions."

Not only is the creation of this library of programs a chore, Zelinski says, but "maintenance is just never ending, because there are always things that customers want to change or add."

Although LTV Steel got off relatively easily by comparison, with only 15 to 20 individual communications links to maintain, Canis says the expense was hardly minor. "I wouldn't be able to put a dollar figure on it," he says, "but I know it was quite costly in terms of both programming time and the purchase of computers and monitors."

Until the emergence of a broadly accepted standard and the development of a software and services market to support it, even companies that were totally convinced of the merits of EDI for reducing both the clerical work load and inventory maintenance costs were hesitant to force investment in a proprietary EDI system on smaller, ancillary suppliers.

Costs were especially worrisome to many companies because the expenditure, which the New York market research firm Link Resources Corp. pegs at between $15,000 and $20,000, produced no real efficiencies for the supplier, who could not use the setup to exchange data with any of its other trading partners.

Now, however, a standards framework exists. It is also possible for companies to use microcomputers, and commercial translation software can be obtained from either independent software companies or value-added network providers (see story page 62). Due to these developments, large EDI users in general, and the auto makers in particular, are pushing hard to make EDI a condition for doing business.

Ford Motor Co., for example, has already presented the case for EDI to more than 100 of its non-auto parts suppliers — an eclectic assortment of businesses, from drill bit manufacturers to paper clip vendors (see story previous page). Thirty are now full participants in

Continued on page 45

BANKERS PUSH FOR EDI

The financial community is becoming a strong proponent of EDI standards. Arguing that it does not make sense for banks to operate two separate networks — one for the exchange of value and one for the exchange of invoice and credit/debit information — Bank of America, First National Bank of Boston, Mellon Bank, NA and others pressured the National Automated Clearinghouse Association (Nacha) to develop an ANSI X.12-compatible version of the Corporate Trade Payments (CTP) system.

In February, Nacha announced a new standard for electronic funds transfer between corporations called the Corporate Trade Exchange (CTX), which is compatible with X.12. The standard allows companies using X.12 to integrate the payments cycle via CTX. It is scheduled for testing this fall.

Information provided by Link Resources, Inc.

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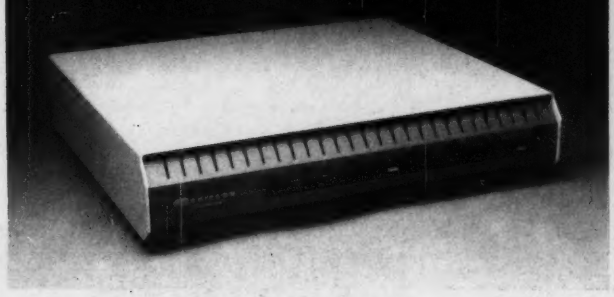

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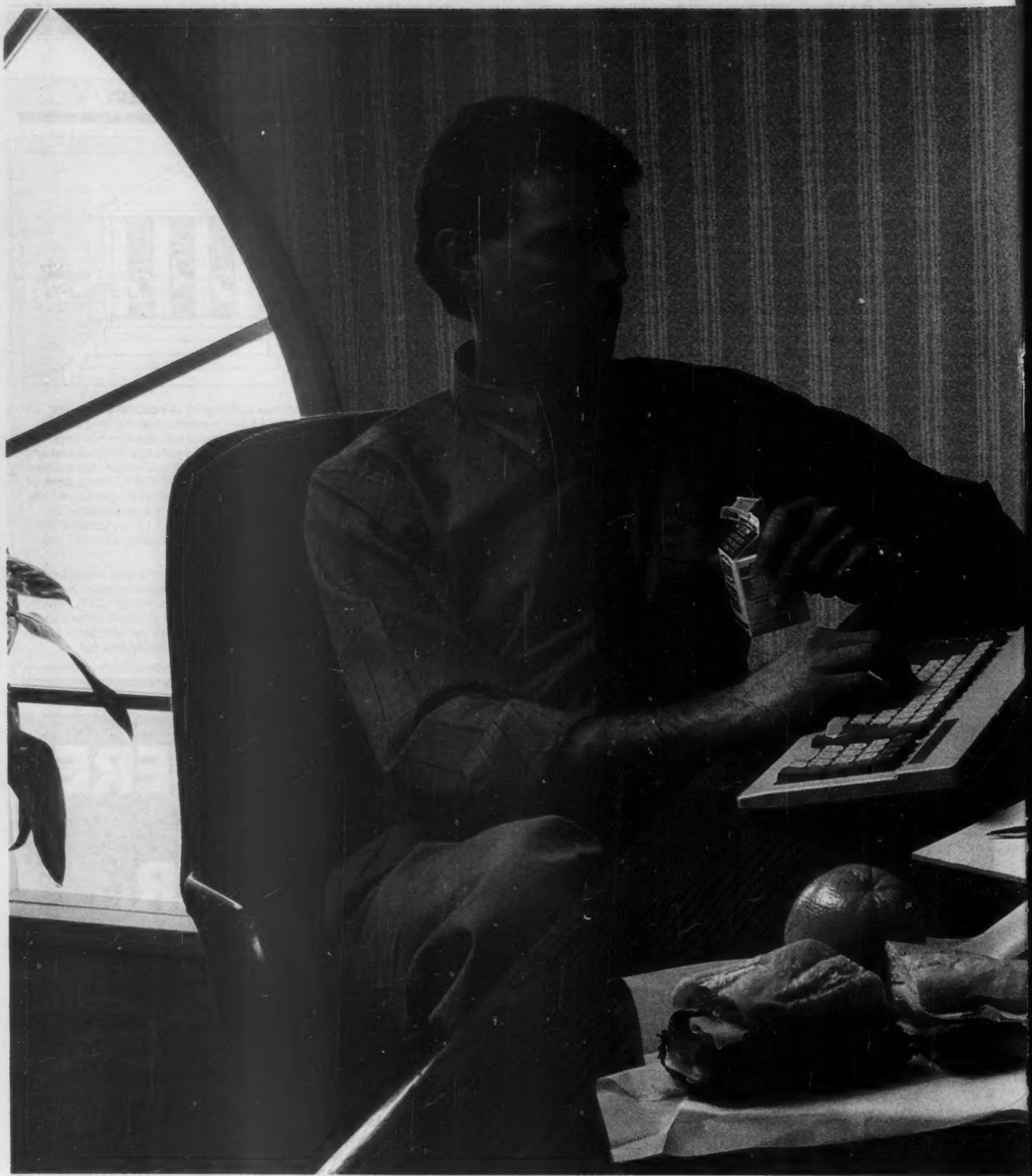

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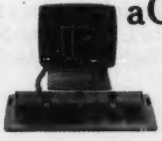

Continued from page 41
an electronic exchange consisting of product orders and releases, requests for quotes and quote responses. Twenty-five more are in a pilot phase.

Charles Richards, supervisor of systems development for the purchasing and supply staff at Ford, is careful to say that the company is not forcing EDI on its suppliers. Still, Ford clearly aims for a paperless order process, which Richards estimates will cut inventory levels from up to several months' worth of on-hand supplies to less than a week's.

And although Ford has not issued any mandates, the fact is, Richards says, that the auto maker is in the process of reducing its base of non-auto suppliers from 5,000 to 3,000. "So it does figure," he says, "that as this EDI effort goes on, some people will drop by the wayside."

The message from General Motors Corp. is even less ambiguous, according to Mike Gerus of AIAG. "GM is telling people right now," he says, "that if they want to do business with the company in the next couple of years, they'd better be prepared to accept payment electronically."

The banking industry represents a recent and major convert to the ANSI X.12 format. After announcing its own Corporate Trade Payments format for paperless cash transfers between businesses in 1984, the National Automated Clearinghouse Association bowed to market realities in 1985 and approved a new X.12-compatible standard called Corporate Trade Exchange (CTX).

CTX, which is expected to be ready for implementation by Jan. 1, 1987, will do more than just marry two incompatible standards, according to James Hopes, vice-president at Chase Manhattan Bank N.A. in New York; it will also channel information resources within companies more efficiently. "Until now," he claims, "people in the treasury department have been doing one thing, while the people in order entry do another."

According to Carol King, product development officer for electronic payments at the First National Bank of Chicago, elimination of such duplication is exactly what the next stage of EDI development is all about. "What is happening now," according to King, who has been working with the AIAG on the design of new transaction sets, "is that EDI transactions are being developed that don't just replace paper documents, but actually streamline the business process by consolidating information."

In the payment process, for example, King says that invoicing may, in many instances, prove unnecessary. "It may be possible to eliminate that document and build a payment file on the basis of other information already received."

It was in order to test such possibilities that the First National Bank turned its own purchasing department into an EDI laboratory and underwrote the cost of its suppliers' participation. Specifically, the bank underwrote the cost of participation in a six-month pilot project for 32 of its largest vendors. "All we asked them to do was supply the personal computer," says Ray Farrell, vice-president and manager of purchasing at the First National Bank. "We purchased the software and picked up the cost of the network mailboxes and all transmissions."

When the pilot phase ends this fall, First National Bank's suppliers will start picking up their own tab, including purchase of the software at a discount price from the bank.

Mauro Cetra, president of Program Science, Inc., an EDI consulting firm and software provider in Ridgefield, Conn., expects similar arrangements will soon become commonplace. In fact, he says, many manufacturers, eager to get into EDI on a large scale, will probably make an outright gift of translation software to their suppliers in order to get them off the mark more quickly.

Actually, cost is already a fairly negligible barrier to basic EDI implementation. It is possible to get started in electronic document exchange for under $15,000 at the microcomputer level.

Barry & Sewall adopted EDI 13 months ago, primarily to retain the business of a single large customer, Burlington Northern Railroad Co. Since the services of a network were not necessary to connect with a customer across town, says DP director Steven Olson, the only expenses were the purchase of a Compaq Computer Corp. microcomputer and a $5,000 version of Program Science's X-Change EDI processor software.

"You can definitely become an online EDI user for $8,000 or $9,000," Olson states. Of course, as Olson also points out, Barry & Sewall's use of EDI is also very modest.

Although other customers have indicated some interest in EDI and Burlington Northern suggested two possible communications providers as part of its general presentation to suppliers, Olson does not anticipate encountering the traffic or distances that will force him to consider a net. That suits him just fine, he says, because he would rather not commit himself to that choice just yet.

"My major reservation," Olson explains, "is simply that a network mailbox service adds another variable into the situation. Right now, there are only two parties that can screw up — me or my customer. Add another one and you are just increasing the danger of something going wrong." For much the same reason, Olson has also chosen not to try to interface the EDI system with any

Continued on page 60

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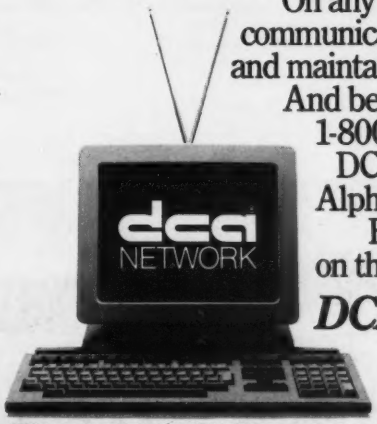

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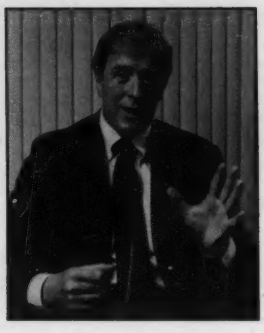

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Banyan Systems	Virtual Networking Systems
Bridge Communications	Bridge Communications LAN systems
Corvus Systems	Omninet, PC/NOS
Digital Equipment Corporation	DECnet-DOS DECconnect
Excelan	LANalyzer EX 5000E EXOS Networking solutions
Fox Research	10-NET
Gandalf Data	PACXNET
Gateway Communications	G/NET LAN
Hewlett Packard	HP AdvanceNet family of products
IBM Corporation	Local Area Networks
NBI, Inc.	NBI Net, Multinet
Nestar Systems, Inc.	PLAN series network products
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Novell	NetWare
Software Research Corporation	SNE product family
Sytek, Inc.	System 2000, 3000, 6000
Teradata	DBC/1012
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Market research organizations and trade journals report weekly on the tremendous growth of local area network systems and micro-mainframe link products. According to some industry surveys, the connectivity equipment market has increased by 150% over the past 15 months and is expected to continue growing at a rate of 50% per year through this decade. As a result, MIS and communications managers today face a bewildering array of options for networking their micros and minis and linking PCs to the corporate mainframe.

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The *National Connectivity Symposium on Local Area Networks and Micro-Mainframe Links* has been developed to educate professionals on LANs, links, and related technologies and to provide a forum for in-depth, product categorization and evaluation.

The symposium format—unique to the seminar industry—combines a one-day educational seminar with three days of hour-long, vendor presentations that enable attendees to make *informed* product decisions.

DAY ONE: SEMINAR OVERVIEW OF CONNECTIVITY ISSUES, TRENDS, AND STANDARDS RELATING TO LOCAL AREA NETWORKS AND MICRO-MAINFRAME LINKS

MORNING SESSION (8:30-12:30)

I. Overview of Corporate Connectivity

II. Micro-Mainframe Links

1. How the Technology Evolved to Its Current State
- a. History & Evolution
- b. Current Technology & Terminology
- c. Framework for Discussion

2. Categorizing Existing Link Products
- a. Terminal Emulation
- b. Simple File Transfer
- c. Extract Only
- d. Open Link
- e. Extract Link
- e. Vendor Integrated Application

3. Practical Implementation Considerations
- a. Performance Aspects of File Transfer in the IBM 3270 World
- b. Performance Aspects of File Transfer in the Async Terminal World
- c. Implications of End User Access to Production Data
- d. Implications of End User Access to "Standard" Corporate Extracts
- e. Issues in Data Transformation
- f. Issues in Storing PC Files on Host

AFTERNOON SESSION (1:30-5:30)

III. Local Area Networks

1. Technology & Design Issues
- a. Overview
- b. Media
- c. Control and Access Techniques
- d. File Servers

2. Review of Switched Based Technology
- a. Voice/Data Integration
- b. Data PBX

3. Standards
- a. 802.2
- b. 802.3, 802.4, 802.5
- c. OSI, MAP, TOP

4. Wide Area Networking and LANs

5. Network Implementation Issues

6. Planning and Integration

IV. Key Related Technologies and Future Trends

1. Peer-to-Peer Protocols
- a. LU 6.2
- b. OSI
- c. TCP/IP

2. File Servers and Database Machines

3. High Speed Interconnection
- a. Channel Products
- b. T1
- c. High-speed Modems
- d. Satellite
- e. ISDN
- f. FDDI

4. Network Software

5. Emerging Issues

V. Overview of Vendor Presentation "Tracks"

FACULTY

LARRY DeBOEVER

Larry DeBoever is an independent consultant in data communications, host software and technology acquisition. He has served as Strategic Planning Director for Ungermann-Bass, and was president of Linkware (recently acquired by Ungermann-Bass). He was founder of Pansophic/Christensen Systems and was previously a Vice President of Computer Corporation of America.

ROY PEPPER

Roy Pepper is currently an independent consultant with over 23 years experience in the communications field. He has held senior executive positions at Ungermann-Bass, B.C. Telephone, Consultec and Impact Information Systems Ltd. In addition, he has coauthored *Broadband and Baseband Systems Design*, a technical publication on LAN design criteria.

Days 2, 3, 4: Product Presentations

PRODUCT PRESENTATIONS

The National Connectivity Symposium is a unique way to analyze the dozens of Micro-Mainframe Link (MML) and LAN products available. You can compare and contrast products while each is still fresh in your mind, and DCAI's experts are available to assist you in your analysis. On Day One the seminar leaders will present a classification system for the various products, which will help you effectively allocate your time among the presentations.

We are fortunate to have fifty leading vendors presenting their products. These companies will make detailed, functional one-hour presentations and be available to discuss their products with you. Each company appearing at the Symposium has provided us with a concise description of the products they plan to present. These descriptions appear on pages 3-5 of this brochure. To get the most out of the product presentations you should spend a few minutes reviewing the participating companies and the products they will discuss.

LOCAL AREA NETWORKS

Local Area Networks (LANs) cover an enormous range of technologies. Is the appropriate media baseband, broadband, fiber, or twisted pair? Or is a combination of these technologies the right solution? Is the primary purpose of the network terminal-switching or resource-sharing? What file server solutions are appropriate? Products from each of these areas will be discussed in detail at the Connectivity Symposium. Nowhere else will you find a comparable gathering of the major LAN vendors.

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The Applitek Corporation provides facility wide communication solutions using local area network technology. UniLAN incorporates standard and non-blocking interfaces that operate at 10 Mbps on baseband, broadband and fiber optic cable. Applitek products include a variety of terminal and host-to-host connections, protocol converting gateways and high speed bridges that are managed by a sophisticated Network Management System.

ASHER TECHNOLOGIES, INC.

Asher Technologies, Inc. designs, manufactures, markets and supports a complete line of communications equipment for IBM PCs including local area networks.

Quadnet IX is the top of the line LAN system linking from 2 to an unlimited number of PCs or compatibles and provides "state of the art" multiple PC information exchange and resource sharing.

Quadnet VI is a midrange LAN which provides multiple PC information sharing.

The Ashernet Server provides the hard disk storage capabilities meeting the most demanding applications.

AST RESEARCH, INC.

AST RESEARCH, INC. develops and markets products which enhance personal computing. AST Local Area Network products offer a variety of cabling schemes and provide full IBM Netbios compatibility. AST Micro-to-Minicomputer and Micro-to-Mainframe link products, offer full 525X and 327X terminal emulation for PC-based access to IBM S3X Mini-computers and IBM Mainframes.

BANYAN SYSTEMS

Banyan's Virtual Networking Systems (VINES) architecture and family of products, the Banyan/BNS, Banyan/DTS, VINES 286, offer complete, flexible communications for the integration of personal computers in a comprehensive computing network. VINES integrates a broad, multi-vendor mix of PCs, local area networks, and host computers so users can pick the right computer resource for the situation. Banyan's product family addresses the full range of network requirements.

BRIDGE COMMUNICATIONS

Bridge Communications is a leading supplier of high performance general purpose local area network systems. The company will present an overview of its Ethernet, Token-ring and Broadband local area network systems. Bridge's broad line of communications servers, gateway servers, PC interfaces, and radio frequency (RF) products enable an organization to capitalize on its entire equipment base—allowing a wide range of devices to be interconnected and to share and access corporate-wide resources.

CORVUS SYSTEMS

Corvus provides a cost-effective network solution that includes PC, AT workstations, file servers, a cabling system, network interface cards, and two network operating systems. Omninet is presently installed on over 25,000 networks and over 250,000 nodes. PC/NOS, to be released in early 87, will be our answer for the rest of the 80's. It is a Message-Based Distributed Network System that allows any workstation to use any resource on the network no matter where it resides.

DIGITAL EQUIPMENT CORPORATION

Digital Equipment Corporation is a leading communications solutions vendor. DECconnect provides a simple, elegant, and cost-effective cabling system that brings high-performance Ethernet and enhanced terminal interconnection to office and work areas. DECnet-DOS allows the IBM PC, PC/XT, and Personal Computer AT systems to participate as non-routing (end) nodes in DECnet and Ethernet computer networks.

EXCELAN

Excelan, Inc. is a leading LAN company that develops and manufactures advanced hardware, software, and network analyzers. Excelan will present its high-performance Ethernet-based networking solution for the DEC, UNIX, and PC worlds. In addition, Excelan will also present their network analyzer, the LANalyzer EX 5000E, a powerful tool for network system developers, LAN administrators, and field service engineers.

FOX RESEARCH, INC.

Fox Research, Inc., is a communications company, providing solutions for corporate America from the departmental level to the corporate environment. The Fox 10-NET LAN runs on IBM PCs, XTs, and ATs, DOS 2.X, 3.X. Fox offers SNA and BISYNC Gateways to the mainframe environment and RS-232 Gateways. Connection to IBM S/36, 38 available.

Days 2, 3, 4: Product Presentations

LOCAL AREA NETWORK PRESENTERS

GANDALF DATA

Gandalf is a leading worldwide supplier of networking systems, multiplexers, and modems which optimize the collection and distribution of electronic information. Gandalf will present "PACXNET," Private Automatic Computer eXchange, a software-based high speed distributed networking system that interconnects a diversity of types and brands of computer and communications equipment.

GATEWAY COMMUNICATIONS

Gateway Communications Inc. is a five-year-old company specializing in the development of innovative communications and networking products for IBM PCs, XTs, ATs and compatibles. Gateway's product line includes the high performance, low cost G/NET PLUS LAN, the G/SNAnet LAN-to-mainframe SNA gateway, the G/x25net Wide Area Network (WAN) gateway, as well as an asynchronous gateway (G/ASYNC) and several industry standard network file server systems (including NETBIOS and NetWare).

HEWLETT-PACKARD

Hewlett-Packard is a supplier of a full line of computers, peripherals and software which can be networked together to provide solutions to business problems. HP AdvanceNet is HP's OSI-based Network Architecture and family of products to provide for distributed data processing in a multi-vendor environment.

NBI, Inc.

Among NBI's solutions to problems of office automation connectivity are NBI Net and Multinet. NBI Net, compatible with Ethernet, links large departmental systems using 3270, VT100 and DISOSS. Multinet connects up to 64 NBI workstation and IBM-compatible PCs through NBI's OAsys 64 series of cluster controllers.

NESTAR SYSTEMS, INC.

Nestar Systems, Inc. is a manufacturer of Personal Computer Local Area Network Hardware and Software. Domestic sales are "direct" to Fortune 500 end-users.

Products featured are high capacity file-servers (150 Mbytes to 1.2 Gbytes) for Arcnet, PC LAN Systems and IBM Token-Ring Networks.

NETLINK

Netlink SNA Servers provide SNA gateway, concentration, and communication transport functions for enhanced SNA networking applications. The Netlink SNA Gate is a SNA gateway for establishments with non-SNA devices (e.g., BSC 3270, 3780, asynch, PCs). The Netlink SNA Hub is a communications concentrator and gateway for establishments with multiple SNA devices. Cost-saving applications for banking, insurance, and DP services companies will be described.

NETWORK RESEARCH CORPORATION

Network Research Corporation will demonstrate Fusion Network Software, a software program that provides connectivity in a heterogeneous environment of processors, operating systems, protocols, and network hardware. PCs using MS-DOS and Xenix will be used for the demonstration. FNS capabilities and its various operating system and hardware options will be discussed.

NOVELL

Novell sells a family of local-area network products for microcomputers that includes Advanced Netware, the leading network operating system. Novell's presentation will show how a network operating system's design can yield superior flexibility, functionality, and performance. Topics to be covered include standards, security, protected mode operations and system reliability.

SOFTWARE RESEARCH CORPORATION

Software Research Corporation, located in Natick, Massachusetts provides network software products and services to major F1000 corporations.

SRC's Strategic Network Environment software allows users of IBM MVS and VM/CMS mainframes, DEC VAX and WANG VS minicomputers, IBM PCs,and various electronic mail packages to freely exchange files, documents and mail.

SYTEK

Sytek designs, manufactures, markets and supports general purpose, open access broadband local area networks for large computer-using organizations. Sytek products include System 2000 for terminal-to-host communications, System 6000 for PC networks and System 3000/7000 for IBM 3270/async communications.

TERADATA CORPORATION

Teradata Corporation manufactures and markets the DBC/1012 Data Base Computer system, an integrated hardware/software parallel processing system for large information—intensive business applications.

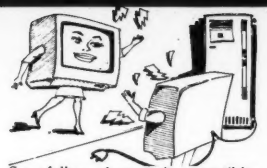
The DBC/1012 integrates multiple mainframes, minis, LANS, etc., running a mixture of operating systems, permitting them to share one relational Data Base through a common SQL user language.

UNGERMANN-BASS

Ungermann-Bass, Inc., the largest supplier of general purpose local area networking products, manufactures, sells, installs, and services vendor independent LAN systems world-wide. U-B will present its Personal Connection products, including the 3270 Personal Connection, which enables users of personal computers to communicate freely with IBM, DEC and other host application programs, Microsoft Networks-based file and print servers and PC applications via the Net/One network.

THE WOLLONGONG GROUP, INC.

WINS (Wollongong Integrated Networking Solutions) provide open systems interconnect capabilities. Based on the TCP/IP protocols (the U.S. Department of Defense standard networking protocols), WINS supports local through wide area networking, providing a growth path as network requirements grow. WINS products are available for PCs, workstations, MicroVAXes, 3Bs, VAXes, Amdahl mainframes and Cray super computers.



Sorry fella, we just aren't compatible.

MICRO-MAINFRAME LINK PRESEN

APPLIED DATA RESEARCH

Applied Data Research, Inc. will present an overview of distributed processing using ADR's Information Distributions System and Distributed Data Base products for data flow and data management. Two specific products will be discussed, ADR/PC DATACOM and ADR/PC IDEAL, with emphasis on the significance of intelligent connectivity between mainframe and PC software.

ATTACHMATE

Attachmate produces high function, IBM-compatible micro-mainframe connections. Topics will cover Attachmate's 3270-PC Emulation Systems for coax, SDLC and LAN-attached PC's. Uses for 3270 Graphics, multiple sessions and the 3270-PC Application Program Interface (API) will also be discussed. A question and answer period will follow.

COMMUNICATIONS RESEARCH GROUP

BLAST is a family of communications software providing a generic communication link among mainframe, mini, and micro-computers from 120 vendors and across 25 different operating systems. BLAST can be distributed to corporate PC users worldwide for error-free data transfer to central minis or mainframes or LANs; or BLAST can be embedded transparently into applications software for a universal communications link.

CULLINET SOFTWARE

Cullinet manufactures database, application and communications software for IBM mainframes and PC productivity software for business users. They will present their Information Center Management System, Goldengate and Infogate. These products combine to provide an application level protocol that transparently connects any PC or minicomputer user to production data without compromising MIS control.

CXI, INC.

CXI, Inc., Palo Alto, California, is a leading manufacturer of 3270 and 5250 micro-to-mainframe communication products. Its products enable IBM PCs, XTs, ATs and compatibles to access and process information located on IBM mainframes or System/3x minicomputers. CXI will provide an overview of its coaxial and remote 3270 and 5250 PCOX Series products, including the PCOX/STANDARD, PCOX/PLUS and PCOX/3270 PC connections, the PCOX GATEWAY and PCOX GRAPHICS Families.

DIGITAL COMMUNICATIONS ASSOCIATES, INC.

Digital Communications Associates, Inc. (DCA) designs, manufactures and markets data communications network equipment and personal computer-to-mainframe communications products. DCA will be discussing a new family of products that bring IRMA functionality and All Points Addressable (APA) graphics capabilities

Days 2, 3, 4: Product Presentations

MICRO-MAINFRAME LINKS

Hundreds of Micro-Mainframe Links (MMLs) are available today with a number of distinctly different architectures, each with unique strengths and weaknesses. The most appropriate solution for your organization may be one using terminal emulation or simple file transfer. Open links or vendor-integrated links are other options you may consider depending on your users' needs. Each of these MML architectures will be discussed in detail at the Connectivity Symposium and the broadest available cross-section of the leading vendors will make in-depth product presentations.

TERS

to personal computers on an IBM Token-Ring Network or other NETBIOS-compatible LANs.

INFORMATION BUILDERS, INC.
Information Builders, Inc. is the eighth largest system software company serving the IBM, DEC VAX, Wang VS, and IBM PC marketplace. PC/FOCUS is a complete 4GL/DBMS for the IBM PC which includes a micro-mainframe link to FOCUS. FOCTALK is a standalone micro-mainframe link that connects IBM or compatible PCs to mainframe computers and enables the up and downloading of data.

INFORMATION TECHNOLOGIES, INC.
Information Technologies, Inc. designs and manufactures LinkUp add-in coax-connect, remote and LAN/gateway PC data communications systems, primarily intended to provide connection to IBM mainframes. LinkUp System's software modules fit within a standardized architectural framework supporting Hot Key, dedicated background print, file transfer and API.

INTEL CORPORATION
Intel Corporation will present its Systems Interconnect Operation Product FASTPATH, a flexible, high performance connectivity platform that allows OEMs and system integrators to design a system connecting an IBM mainframe and industry standard MULTIBUS R-based application, i.e. LAN's dissimilar hosts, GANs, and special peripherals.

LEE DATA CORPORATION
Lee Data Corporation is a manufacturer of networking and local processing systems for the 3270, async, and PC environments. Lee Data and their Datastream Networking Division will be presenting innovative solutions and products which address today's 3270 gateway issues and provide micro-mainframe links.

LOTUS DEVELOPMENT CORPORATION
The Application Connection is a line of PC and mainframe products from Lotus, designed to connect many PC applications, micro-mainframe links,and host applications. T-A-C supports all communication links and many PC application packages. T-A-C provides PC users with extract and import capabilities to mainframe packages including SAS, FOCUS, RAMIS, NOMAD, SQL/DS, and others.

MARTIN MARIETTA DATA SYSTEMS
Martin Marietta Data Systems provides the UNISON series of PC products for a comple'e information center workstation. The UNISON-MicroMainframe Connectivity products will be featured. These include RAMlink, which provides PC access and reporting from mainframe RAMIS II: VIRTUALink which expands the storage and data sharing capability of the PC; pc/Mainframe for data transfer from CICS: and LinkIT for asynchronous micro-mainframe connectivity.

MICRO-MAINFRAME LINK PRESENTERS

McCORMACK AND DODGE
McCormack and Dodge, a company of the Dun and Bradstreet Corporation, will be presenting Interactive PC Link, a tool that bridges the gap between mainframe data and personal computer users.
Selective downloading/uploading capabilities combined with its on-line query and reporting features, provide a flexible information retrieval system for both PC users and 3270-type terminal users.

MICRO DECISIONWARE
Micro Decisionware provides Intelligent Data Access Tools for PCs. PC/SQL-link provides the PC users with access to DB2 and SQL/DS databases, Teradata and Britton Lee database machines. Major functions include:
- Creation of SQL requests using menus
- SQL requests transmitted to the host
- Automatically reformatting of data for use with PC applications
- Data structures stored on the PC.

MICRO TEMPUS INC.
Micro Tempus Inc., a leader in the micro-to-mainframe software market, developed the popular TEMPUS-LINK product. Best known for its much copied Virtual Disk concept and its powerful Host Application Programming Interface, TEMPUS-LINK offers a simple file transfer between IBM PCs and all major IBM mainframe operating systems.

NETWORK SOFTWARE ASSOCIATES, INC.
Network Software Associates, Inc. develops and markets a wide range of PC communications products for both PC-to-PC and PC-to mainframe applications. The company will present its AdaptSNA RJE PC-to-mainframe package, highlighting the advantages of Remote Job Entry (RJE) over 3270-type communications, particularly in unattended operation applications.

ON-LINE SOFTWARE INTERNATIONAL, INC.
On-line Software International, Inc. provides Software Products, Education, and Consulting. FREE-LINK is a powerful micro-to-mainframe link that eliminates the need to program mainframe data extraction and reformatting for use at the PC. OMNILINK is an advanced micro-to-mainframe link that provides direct file uploading to CICS and support for IDMS and ADABAS file structures.

PATHWAY DESIGN
Pathway Design is a leading developer of Micro-to-Mainframe connecting products for the IBM PC and compatible computers. Pathway will present its netPATH and pcPATH product lines. The pcPATH products connect a single PC to a remote IBM hosts in either an SNA or BSC environment. The netPATH local area network (LAN) gateway products allows PCs attached to a LAN to access IBM mainframes in an SNA environment. All Pathway products include innovative features such as file transfer, "hot key," multiple session support, Auto-Dial and an Application Program Interface (API).

SIMWARE INC.
Simware, Inc. is a leading supplier of Data Communications Software products for IBM 370 systems running either VM or MVS/VTAM and for IBM compatible personal computers. SIM3278 is a host-based application that provides 3270 emulation for IBM compatible PCs and more than 50 ASCII terminals. SIM 3278/PC is a micro to mainframe package that offers error-free file transfer.

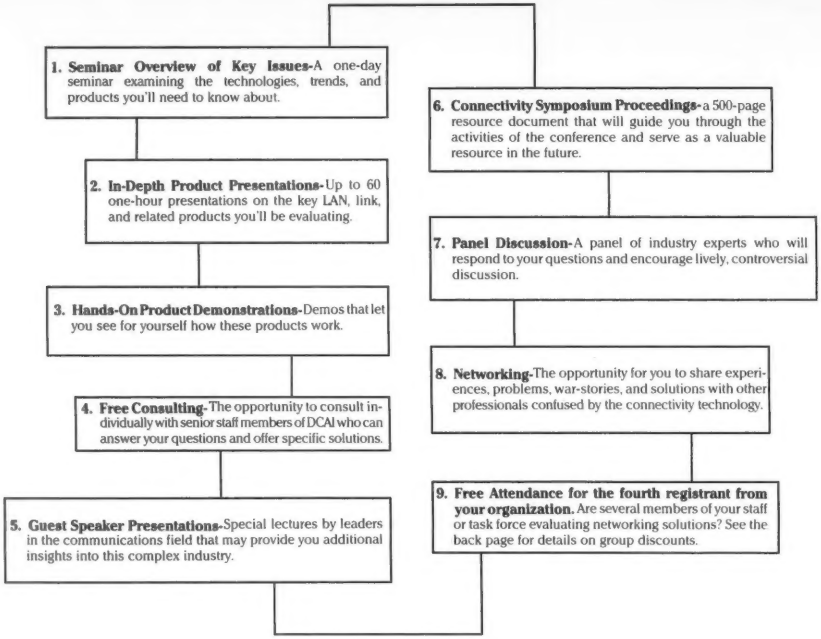
SOFTWARE AG OF NORTH AMERICA
A micro to mainframe link enabling both uploading and downloading of data, NATURAL CONNECTION extends all the power and productivity benefits of NATURAL to the personal computer user, and allows the distribution of processing and data storage across PC-mainframe boundaries.

TANGRAM SYSTEMS CORPORATION
ARBITER is a VTAM-based cooperative processing subsystem that integrates microcomputers and mainframes. ARBITER represents a generic communications software solution regardless of the current or future network connectivity or applications development environment. ARBITER provides optimal transfer rates, support for large numbers of micros connected simultaneously with low-system and network overhead, remote virtual disk on mainframe DASD, advanced application program interfaces, and 4GL database extractions.

VM PERSONAL COMPUTING
VM Personal Computing's RELAY Family of communications software provides error-free communications between IBM and compatible PCs, and between PCs and IBM mainframes. PC packages feature background operation and script language with learn mode for automating and customizing communications. Hardware-free 3270 emulation is possible, and popular 3270 emulation boards and protocol converters are supported.

XYPLEX, INC.
XYPLEX Inc.'s Distributed Network Communications Systems provides front-end processing for VAX and MicroVAX family computers, and interconnections for IBM computers and PCs, as well as terminal devices. Network cabling choices include Ethernet, Linear Coaxial, CATV, and Optical Fiber. The system is installed primarily in Fortune 1000-class organizations.

9 REASONS WHY YOU SHOULD ATTEND



THE UNIQUE FORMAT OF A DCAI SYMPOSIUM

In 1981, Dr. George Schussel devised a format for the well-known *National Database & 4th Generation Language Symposium:* one day of educational seminars providing a background in database technology, issues, and products followed by three days of hour-long product presentations and live demonstrations by leading vendors. For five years, thousands of attendees have participated in these conferences in order to research state-of-the-art technology and evaluate software for their organizations.

Now DCAI is applying this proven format to the evaluation and selection of connectivity products. *The National Connectivity Symposium on Local Area Networks and Micro-Mainframe Links* will not only enable you to learn what you need to know but talk with the vendors who count.

Day One

On Day One, our Symposium Keynote Speakers will orient you to the world of networking and connectivity, exploring the issues, standards, trends, and products you must understand to make informed product decisions. As part of our Symposium format, we will also provide a classification scheme of these products. This categorization will help you determine which product presentations you should see during the following three days.

Days Two-Four

On the second, third, and fourth days you will have the opportunity to apply the concepts learned on day one while attending one-hour product presentations on all of the leading M-M link *AND* LAN products. Four presentations run concurrently and you may move between presentations as you wish.

In addition on these days, guest speakers, all industry leaders, will speak on a variety of topics which affect the link/LAN industry. They will provide valuable insight into industry trends, in order to help you achieve the maximum benefit from your new knowledge. These speakers will also be available throughout the four days to answer questions and offer implementation advice, and suggestions.

Finally, on Day Four, the symposium will conclude with a panel discussion, featuring industry leaders fielding attendee questions. These discussions offer you the opportunity to let influential people know what you as the customer are thinking.

SPECIAL FEATURES

GUEST SPEAKERS

WILLIAM JOHNSON
Vice President Distributed Systems
Digital Equipment Corp.
"Changing User Requirements: Beyond Connectivity to Integration"

CHARLES MOREL
Chairman and Founder
CXI, Inc.
"The Evolutionary World of 3270 Connectivity"

DR. GEORGE SCHUSSEL
President
Digital Consulting Associates, Inc.
"Hardware and Software Futures: Interconnecting your Microprocessors, Networks and Database Management Systems"

DR. ROBERT STEEN
Systems Manager of Network Systems
IBM Corp.
"IBM Local Area Networks: High Speed Connectivity"

DR. FRED STERN
President
Fourth Generation Systems
"The Token Ring Standard: Vendor Independence Implications"

JOHN TODD
Manager of Strategic Planning
Bridge Communications
"Internetworking Challenges"

WHO SHOULD ATTEND

MIS Directors and DP Managers - who need to acquire and manage the communications products that will enable the effective sharing of information resources.

Communications and Network Managers - who plan to interconnect corporate MIS resources to achieve greater productivity within the company.

Data Base Administrators - who need to understand the technologies and their implications as increasing numbers of users demand access to the corporate database.

Application Systems Managers and Analysts - who also must understand the technologies in order to develop distributed applications.

Executives, Planners, and Senior Management - who want to ensure that connectivity decisions meet the strategic needs of the company.

Departmental Managers - who expect greater access to corporate resources for distributed processing.

DON'T MISS THIS CHANCE TO ATTEND IF:

- You need to improve programmer productivity
- You are at the decision making stage of switching to a LAN
- You are concerned with the way your current link is working
- You are interested in evaluating LAN and link products
- You are experiencing problems with incompatible systems
- You are concerned with end-user satisfaction
- You are interested in how connectivity issues impact your company's strategic plan
- You need to understand emerging standards

HOSPITALITY SUITES

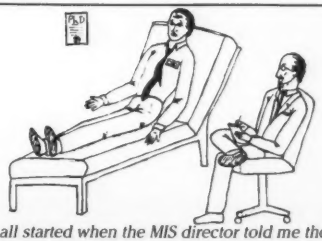
These suites provide a relaxed environment in which you can ask questions and socialize with industry leaders. Enjoy the hands-on product demos and the chance to relax and share the company of fellow attendees!

PROCEEDINGS

Every symposium attendee will also receive a copy of our "1986 National Connectivity Symposium" Proceedings, a useful resource guide long after the Symposium is over.

PANEL DISCUSSIONS

These lively, informative, often controversial question and answer sessions offer you the opportunity to question industry leaders and use their expertise to reach solutions to unresolved issues.



"It all started when the MIS director told me the system wasn't compatible."

TWO WAYS TO REGISTER:

1. Call **617/470-3880** between 9:00 a.m. and 5:00 p.m. Eastern Time
2. Fill out and mail in the coupon below (please include mailing label)

REGISTRATION FEES

Individual Fee, Entire 4 Days	**$795**
Second and Third Registration	**$695**
Fourth Registration	**FREE**
Fifth Registration and Over	**$495**
Individual Fee, Day One Seminar Only	**$395**

GROUP ATTENDANCE: Previous attendees of our Symposium have told us that the best way for companies to gain the most benefit from the program is to send two or more attendees. Our discount structure is designed to encourage multiple registrations from the same company. Have you considered sending representatives from different departments, division, or locations within your organization?

DIGITAL CONSULTING ASSOCIATES, INC.
These seminars will be conducted by Digital Consulting Associates, Inc. (DCAI), a leader in the field of EDP management training. DCAI is located at 5 Kimberly Terrace, Lynnfield, MA 01940, telephone (617) 470-3870.

CANCELLATION POLICY
Cancellations received two weeks or more prior to the Symposium will be accepted subject to a cancellation service charge of $50. Transfers to a different Symposium date or substitutions will be accepted with no cancellation service charge as long as the fee is paid and the request is received before the date of the original Symposium. Registrants whose cancellation requests are not received two weeks prior to the Symposium (or no shows) are liable for the entire fee.

IN-HOUSE SEMINARS
We can bring many of our seminars in-house to your company. Our in-house seminars are one of the most cost-effective ways to update your managers and professionals about the leading software tools and technologies. For more information, call (617) 470-3870 and speak with our In-House Seminar Coordinator.

SOFTWARE INSTITUTE OF AMERICA
These seminars are sponsored by Software Institute of America, Inc. (SIA), a non-profit educational organization dedicated to increasing understanding of advanced business oriented software. SIA is based at 8 Windsor St., Andover, MA 01810, telephone (617) 470-3880.

SHERATON INN & INTERNATIONAL CONFERENCE CENTER **December 8-11, 1986**

The Sheraton Inn and International Conference Center is located in the heart of Virginia's Hunt Country, just minutes from Dulles Airport and the Pentagon. This unique conference center offers 302 rooms, the elegant Derby Restaurant and Derby Lounge, tennis courts, pools, and an adjacent twin cinema. Also adjacent to the hotel is a small shopping center featuring a full service bank and many small shops. The Sheraton Inn and Conference Center is located at 11810 Sunrise Valley Drive, Reston, VA 22091. (703) 620-9000.

Contact the hotel directly to reserve a room. A block of rooms is being held until three weeks before the symposium. For preferred treatment and lower room rates indicate that you are attending a symposium sponsored by Software Institute of America, Inc. and conducted by Digital Consulting Associates, Inc. Room registrations and hotel charges are the responsibility of the individual participant.

REGISTRATION FORM

National Connectivity Symposium on LANS & Micro-Mainframe Links
☐ **Washington, D.C., December 8-11, 1986**

TYPE OF REGISTRATION
☐ **Single Full 4-Day @ $795** ☐ **Day One Only @ $395**
☐ **Multiple (See Registration Fees)**
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Interview

EDI linked to just-in-time manufacturing at Navistar

Ben Milbrandt, manager of materials operations at Navistar International, recently completed a one-year assignment as the associate director for the Automotive Industry Action Group (AIAG). Currently, Milbrandt is vice-chairman of the ANSI X.12 B committee and actively involved with the publication of the Joint Electronic Data Interchange (JEDI) dictionary.

How did Navistar learn about Electronic Data Interchange (EDI) and how long has it been using an EDI net?

We started out seven years ago, when we were approached by some of our suppliers who were communicating already through EDI with Ford Motor Co. and General Motors Corp.

They thought EDI would help them lessen their exposure to the adverse effects of a downturn in the market. At the same time, we were working on the concept of developing a better information system for ourselves. Since the expansion to communications with suppliers was a natural, we began communicating with approximately 30 suppliers.

Was it a proprietary net then?

Yes, back then there were no national standards. Everyone was using their own fixed, in-house formats. But our proprietary program was so successful in the first 18 months that we were able to reduce our inventory by about $167 million. We didn't realize we would have anywhere near that type of success.

The network also gave better information and better planning tools to our suppliers.

By giving them four weeks' worth of detailed information that is fairly reliable, they can plan their production, to the piece, for what we need. Before we started with EDI, we had 33 days' worth of engines on hand. Now we are actually working with about four hours of inventory.

That didn't happen overnight, it took several years, but now we have four hours' worth of engines shipped sequentially.

So you are operating a just-in-time facility?

Yes. Many of the components are just-in-time, although the just-in-time philosophy works a little differently, depending on the supplier. For some suppliers it means ship sequentially and have as little as four hours' worth of inventory on the floor. For other suppliers, such as the one that makes our instrument clusters, the just-in-time philosophy is a total concept for the elimination of waste — including the freight transportation charges.

How many distributors are connected to your EDI net now?

Approximately 600 ship to the Springfield [Ohio] plant and approximately 105 ship to the Chatham [Ont., Canada] plant. That's about half of our suppliers.

You started off seven years ago with 30 suppliers, and now you are up to 700?

Yes. Now the state of the art is a lot more advanced. Caterpillar Tractor Co. started in the June of last year. They now have 350 suppliers on-line. They did it in a relatively short time because they are using standard formats and many of their suppliers were already communicating with other manufacturers. Today a company can virtually bring on all of its suppliers in a year to two-year time frame.

Was it difficult moving from a proprietary net to the standard, and do you still use your proprietary net?

We have gone to the standardized X.12 formats; that is, we offer it. But we give our suppliers an option. They can use Navistar's standardized formats, which they have already been programmed to use, or they can go to the X.12 standard at their convenience.

I suspect that in a couple of years' time, the majority of them will have switched over, but right now we are not mandating that they go to the X.12 format. The majority of suppliers that we have signed up this year have said, "Well, I like the standardized format, and I'll wait till you have that available." When we made that available in May of this year, we got a big flood of suppliers signing up.

Specifically, what type of information do you pass over EDI nets?

Presently, we are sending material release and we also receive a ship notice from the suppliers.

Like I said, we have our own communications net, but in the next several weeks, we will be making a corporate decision concerning selecting a third-party service. This would make it less expensive to the suppliers and to us as far as supporting a communications network.

In the next year we plan to expand the system to include invoices and an evaluated receipt system similar to what Ford uses today. Ford receives the ship notice and then tells the supplier that he doesn't have to send an invoice because Ford can use the ship notice to create the payables documents.

Ford's payables records are already created from the receiving file. When Ford confirms, "Yes, the goods have been received," the systems will send a message to the accounts payable system that says, "Now handle this as though it were an invoice."

How long do you think it will take you to get up to speed?

We are projecting to bring up a test this fall on the first 20 suppliers, and then the expansion will be gradual over the next year or so. Probably by the end of '87 we will have 150 to 200 suppliers on-line.

What are the pros and cons of dealing directly with your suppliers through your own network as opposed to going with a third party?

The advantage for us is that we can bring up suppliers a lot more quickly. Third-party services can handle the communications protocol and testing of the data. And the use of a third-party vendor brings in the supplier very economically.

It also means less investment in capital equipment and that we can expand the EDI offerings more rapidly because we don't have to double or triple our network to handle additional flows of information.

We will be migrating toward payment of freight bills sometime next year and if the demand on our own communications network doubles or triples — we can't really handle it and serve our own internal network.

We realize that for those companies who we exchange tremendously high volumes of information with, it might be more economical if we maintained a dedicated line, but for the majority of our communications, the third-party net provides better windows, better service.

You mentioned a minute ago that you were thinking of paying for your shipping costs through EDI. Do you think that the banking industry is going to offer EDI-compatible financial services soon?

They already do. Dennis McGinnis from North American Phillips Corp. uses, I believe, Chase Manhattan Corp. for his freight bill payments and that is EDI.

I understood that the Electronic Funds Transfer standard was not compatible with EDI yet?

I was talking yesterday with Terry Turner from Nacha [National Automated Clearinghouse Association], and she said the actual CTX [Corporate Trade Exchange] standard will be available in April of 1987. So that is correct. Many are using the automatic check clearinghouse.

What are the market pressures that seem to be pushing a national standard?

There are a couple of pressures and one big one. Ford, GM, Chrysler Corp., Navistar and Caterpillar, the companies using EDI, found that it saves them so much money to communicate with the major suppliers that they wanted to expand their networks to include 100% of their supplier base.

And now, EDI hardware and software is cheap enough so that you can set up EDI communications with a personal computer. If you migrate to a standard, it makes it less costly for the supplier, because he only has to program once.

Tell me about the JEDI committee. Have they resolved differences between TDCC and X.12?

Yes. The preliminary JEDI dictionary was published in June. It is now ready in final form and will be published and presented this month at the X.12 meeting in Los Angeles and made available to the general public. It will be presented to X.12 to become a national standard. The transportation data coordinating committee says, "Yes, we agree that is right." And yes, it did try to resolve the differences between TDCC and X.12. The issues have been resolved.

Do you have any recommendations for Computerworld readers interested in implementing EDI nets? Where should they be in the planning process?

They should be considering EDI and discussing it with third parties since that is the most economical way to get involved in a hurry. They should also look at purchasing software — there is mainframe translation software available either through a third party or through software houses that will talk to virtually any kind of mainframe system. It can also be PC based.

If a company is talking about a translation system, it can get in and buy a package for $15,000 to $20,000 that will handle virtually all of the communications packages that it needs. As for applications, look for high-volume paperwork — that's the quickest payback.

For companies that receive a lot of invoices, EDI is a natural. For those that send a lot of invoices, EDI is a natural. If they have a lot of freight bills that they process, EDI is a natural. Roughly you can figure $5 saved per document if you send it electronically or, from the other end, if you receive it electronically. ■

Navistar's Ben Milbrandt

For companies that receive and send a lot of invoices, EDI is a natural. For those that process a lot of freight bills, EDI is also a natural.

Third-party vendors help users consolidate EDI transactions

Mailbox also acts as security buffer

By MARK WINTHER

Third-party service vendors are hustling to provide products for those users who determine that the development of custom Electronic Data Interchange (EDI) communications lines via leased line or dial-up networks is unnecessary.

These vendors aim their services at users who do not have the interest or the resources to perform message translations or to invest in communications links with their trading partners.

They also provide users with a means to consolidate their EDI transactions. By accessing a third-party EDI mailbox, users can send to multiple recipients and receive from multiple locations in a single transmission.

Some users claim that by contracting with third-party mailbox vendors, they can enjoy the benefits of EDI without the security risks of opening their computer systems to the outside world. For these companies, use of a third-party mailbox provides a security buffer between the external world and the company's internal systems. No one, therefore, has direct access to the organization's mainframe.

Heinz U.S.A. is one company that uses a third party for its EDI mailboxes. It sends and receives mail twice a day through the McDonnell Douglas Electronic Data Interchange Co. Ontyme service. By using the mailboxes, Heinz's systems are more secure, and the company does not have to deal with the complexities of dialing busy signals and so on.

According to Tom O'Hara, manager of computer systems at Heinz, the company may invest in a communications processor front end for its EDI operations. But this investment would have to involve the sales department as well as data processing.

Although still in its infancy, EDI implementation is characterized by rapid growth. The third-party EDI services market was estimated to be less than $20 million in 1985. By 1990, third-party vendor revenue is expected to reach $200 million. Thereafter, significant growth can be expected in value-added applications beyond electronic ordering and invoicing.

> ***By accessing a third-party EDI mailbox, users can send to multiple recipients and receive from multiple locations in a single transmission.***

These applications may include the integration of the payment cycle in electronic funds transfer and access to a general data base that includes information on product availability, discount programs and product shipping status.

Currently, third-party EDI-related offerings take two different forms: mailbox management and communications services and formatting or document translation software. Vendors will see the greatest long-term opportunities in the communications service. As more companies come on-line with their trading partners, the transaction volumes will grow exponentially. Even more attractive to third-party vendors will be the abovementioned secondary EDI applications expected after 1990.

There are a handful of companies providing these mailbox management and communications services today: Control Data Corp., General Electric Information Services Co. (Geisco), IBM, McDonnell Douglas, Sterling Software, Inc. (which acquired Informatics General Corp.), Kleinschmidt (a division of the SCM Corp.), Railinc Corp. (a subsidiary of the American Association of Railroads) and Transettlements, owned by the Atlanta-based trucking firm Transus, Inc.

Until the demise of Net 1000, AT&T was also a player in this market. It is very likely to return to the market, but no offerings are expected before 1987.

There are also dozens of software houses selling EDI translator products. Link Resources Corp. estimates that 200 to 300 of these systems were installed in 1985, approximately 65% of which were microcomputer-based. Significant vendors here include Metro Mark Integrated Systems, Inc. (Roslyn Heights, N.Y.), EDI, Inc. (Odenton, Md.), The APL Group, Inc. (New Canaan, Conn.) and Program Science, Inc. (Ridgefield, Conn.).

To date, the most successful EDI vendor strategy has been to target specific industries — Informatics in pharmaceuticals and hardware/housewares, Kleinschmidt and Railinc in railroads and Transettlements in trucking.

Market leader Informatics grossed $4 million from its 1985 EDI business; Kleinschmidt, Railinc and Transettlements are all in the $2 million to $3 million range.

The McDonnell Douglas and Geisco offerings have focused on vertical industries, respectively in grocery and heavy equipment/automotive, but recently the companies have been trying to offer more horizontal services. They are betting on volumes of low-cost transactions and users, rather than on expensive specialized services for highly focused applications. This strategy is risky, as they are putting more into their EDI operations than they are getting out.

The EDI role of public-domain electronic mail services like Dialcom, Inc. Dialcom, MCI Communications Corp. MCI Mail and Western Union Corp. Easylink is yet to be determined. Nearly all the E-mail vendors offer a forms capability allowing users to create and distribute common forms that solicit the same information from multiple sources, a rudimentary form of EDI.

Moreover, the electronic mail industry is currently heavily involved in the development of X.400 Message Handling Systems.

The express-courier industry is also moving quickly to provide electronic transmission of invoices to the accounts-payable computer systems of large shippers. Players in this high-growth, highly competitive business have already developed very sophisticated invoices and transaction information is a simple extension of the internal system.

Airborne Express Corp., a pioneer in providing EDI options for its volume customers, claims that companies sending 1,000 monthly shipments can save $10,000, or $10 per invoice, by replacing paper invoices with EDI.

Federal Express Corp. and Purolator Courier Corp., which currently offer invoice information on electronic tape, are enhancing their customer automation systems to integrate Electronic Data Interchange alternatives. ■

Winther is director of new communications services at Link Resources Corp., a New York market research firm.

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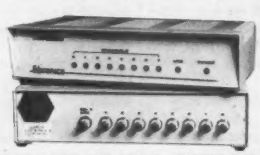

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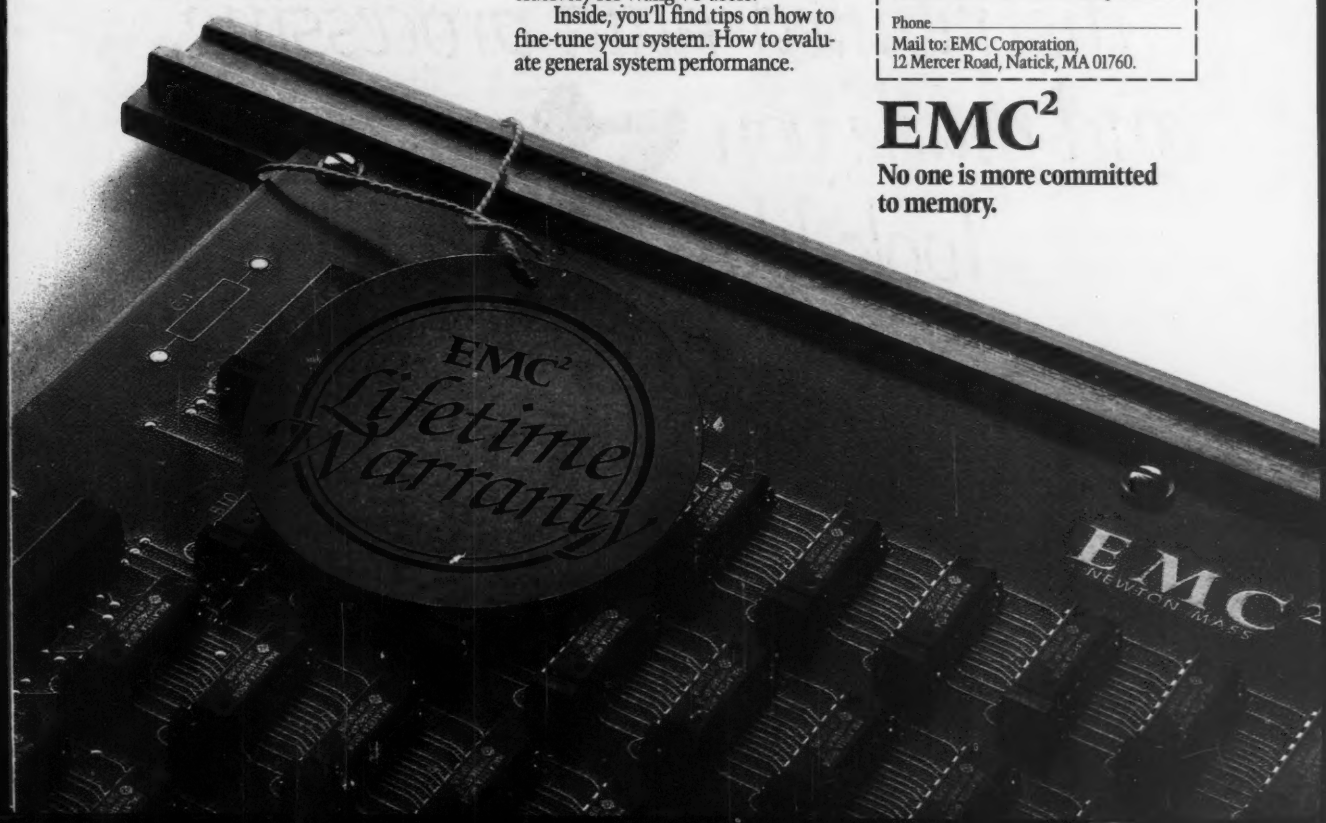

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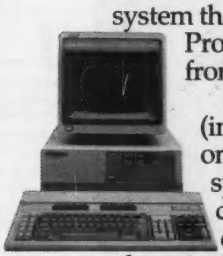

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Continued from page 45

other internal system. "I'm using it more or less as a word processor," he says. "We just print out the document that is sent and use it as a form for data entry."

Since the elimination of paper handling and keystroke entry are usually considered to be one of the major benefits of EDI, Olson's approach might be considered somewhat counterproductive except for the fact that, as far as Barry & Sewall was concerned, cost reduction was never really the point.

"We weren't looking for any bonanza in EDI," he says. "We saw it as a modest investment in the future and a good way to protect our business by meeting a customer's needs."

Although there are substantial cost savings associated with the use of EDI, Olson's attitude is not really all that atypical, according to the Yankee Group's Audrey Mandela.

At an EDI users seminar recently held by the market research firm, she says, many attendees reported that their corporate management did not ask them to cost-justify EDI and were satisfied that the investment was a sound one, as long as replacing paper with electronic forms transfer seemed to be streamlining operations and improving customer relations.

Of course, the two considerations do not have to be mutually exclusive. "The aspect where we see the most benefit is in the correctness of data," United Refrigerated's Bridges says. "If a mistake is made on an order and we send out the wrong order, it is very expensive, both in terms of actual costs and customer dissatisfaction."

In the case of such an error, he explains, United Refrigerated is responsible for compensating for lost sales and must shoulder the expense of transporting the product back to the warehouse. "Then, of course, there's the time it takes someone to restock the items and rework the correct order," Bridges adds.

What is often even worse, however, is the resulting loss of customer confidence. "As you can imagine," Bridges says, "if a customer is having a special promotion at a store in Florida and we ship the wrong product, it might take weeks or months to restore the relationship."

There are a number of different ways to approach EDI. Some companies spend a long time investigating the software and services available and lining up a group of trading partners willing to work with them, according to the Yankee Group's Mandela. Sometimes these planners have rehearsed everything so carefully, she says, that they are able to move into a live implementation within a couple of months. For others, the testing cycle can last a couple of years.

In industries in which trade associations have been involved in EDI standards development and piloting, the discovery process is usually shorter. In many cases, industry associations have worked in conjunction with value-added networks or software developers on their pilot tests and can offer ready-made solutions.

The NRMA, for example, collaborated during its pilot phase with General Electric Information Services Co. of Rockville, Md., one of several vendors providing value-added EDI services.

Translation software was also developed during the pilot phase, and it will be made available to association members. This software, currently configured for mainframes, extracts document information from internal files in flat file configuration and then organizes it in the ANSI X.12 EDI format, adds control characters and optimizes the number of characters. The reverse operation is performed on the receiving end.

Companies may also opt to pursue EDI through a value-added communications provider that will handle the translation as part of its service, thereby eliminating the need for translation software at either end of the exchange.

Program Science's Cetra, however, does not believe that such services, which tend to be costly and may not have the flexibility a compa-

Continued on page 62

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Continued from page 60

ny requires to maximize its use of EDI, constitute the best entry route.

But if avoidance of all technical bother is a mistake, he adds, so too is total and immediate immersion. "Some people try to idealize what can be done with EDI and set out to create a fully integrated system immediately," he says. "What's likely to happen, if they try to do that, is that they'll spend nine months to a year and big bucks building a mainframe solution, only to find out at the end that it isn't really what they need."

It is far better, Cetra says, to start out small, maybe with a microcomputer and a few trading partners and work out the kinks there. "Get your feet wet before you start trying to tie EDI into your business systems." ■

Commercial software market burgeoning

For those who choose not to construct their own translation programs for an Electronic Data Interchange (EDI) network, there now exists a substantial selection of commercial software products designed for this purpose.

Companies that are among the primary sources of such software at the moment include Metro-Mark Integrated Systems, Inc.; The APL Group, Inc.; Program Science, Inc.; and EDI, Inc.

The list, however, is growing rapidly. The Automotive Industry Action Group (AIAG) recently released an extensive list of approved suppliers of EDI software, and a number of service bureaus — such as Sterling Software, Inc. (which aquired Informatics General Corp.) — offer software as well as value-added services such as the creation of specialized data bases from EDI transactions for demand forecasting and geographic preference analysis.

What is more, EDI compatibility may soon become a feature in standard business software. Management Science America, Inc. (MSA) of Atlanta, which has been working with the ANSI X.12 committee for almost four years, has already taken a step in this direction by constructing the data base of its accounting and financial software to conform with the field sizes and formats of EDI.

By the end of 1986, the firm expects that it will have a version of its software ready that is capable of generating outgoing transactions such as purchase orders, invoices and payment forms.

A third phase of development, which should be complete by some time in 1987, according to Vice-President Pat Tinley, will provide direct acceptance of incoming EDI transactions into MSA software files. "What we expect to be able to do," Tinley says, "is input payments directly into accounts receivable and orders into order processing."

Right now, MSA seems to have the field to itself, but Tinley does not expect that to last very long. "I think it's inevitable that the competition will follow," he says. "I think it's almost going to be a requirement for anyone marketing accounting systems within two or three years."

Equally inevitable, according to most industry analysts, is an eventual conversion from direct point-to-point EDI communications to third-party networks such as Control Data Corp.'s Redinet, General Electric Information Services Co.'s EDI Express, McDonnell Douglas Electronic Data Interchange Co.'s EDI Net and IBM with its Information Network.

Without recourse to a third-party carrier, says Victor Wheatman of the market research firm Input, managing the connections and adjustments can turn into "a very expensive variety of spaghetti soup."

Caution should be exercised in selecting a network service at this stage, however. "This is not a time to make a selection on the basis of lowest pricing," says Audrey Mandela of the Yankee Group, noting that she has heard some complaints regarding the quality of service and lack of knowledge about specific industries.

— JOANNE KELLEHER

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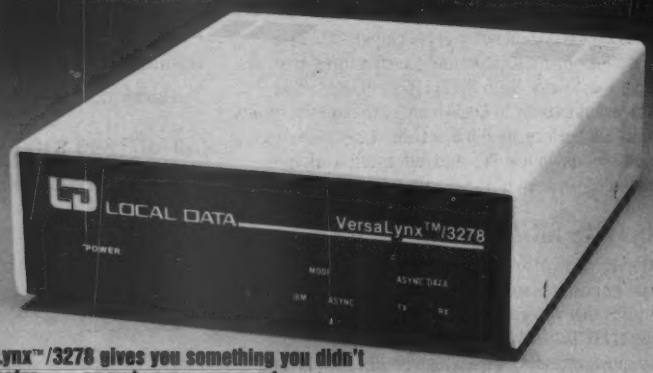

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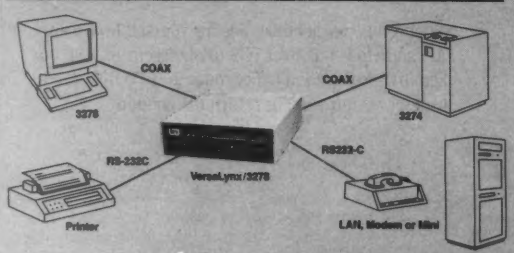

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In keeping with our established reputation for improving the industry standard in personal computing, COMPAQ announces still another improvement. A new personal computer that's the first of its kind. One that carries you far beyond the limits of today's "advanced technology" personal computers. It's the new COMPAQ DESKPRO 386™, and it reaches far higher levels of speed, compatibility, performance,

Introducing the new COMPAQ DESKPRO™

The most advanced personal

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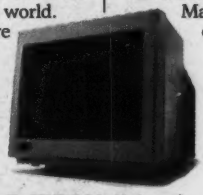
advanced-technology computers

and expandability than have ever been attainable in personal computers.

Dozens of separate enhancements have been combined in one personal computer to make the COMPAQ DESKPRO 386 the most advanced personal computer in the world. There's no personal computer more ideal for power users, networking, and connecting to mainframes.

The new high-speed, 32-bit, 16-MHz Intel® 80386 microprocessor forms the heart of this breakthrough. It's the latest from Intel's popular family of microprocessors that now power over nine million industry-standard personal computers. As such, it runs all the popular personal-productivity software you already own two to three times faster than ever *and* now lets you do things never before possible on personal computers.



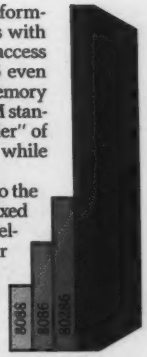
The COMPAQ Color Monitor works with software designed for a wide variety of display standards: EGA, CGA and monochrome.

Each component the very best

Performance enhancements go far beyond the microprocessor, however. Every component has been optimized to take advantage of the increased speed and power of the 80386. We offer, for instance, far more memory than most other advanced-technology personal computers. A 32-bit memory bus that eliminates data "bottlenecks." And fast static column RAM with only one "wait state." Together, these advances increase overall performance and make you more productive than ever before.

Another way we've increased performance is by providing fixed disk drives with larger storage capacities and faster access times. The COMPAQ DESKPRO 386 even has the built-in COMPAQ Expanded Memory Manager that, following the LIM standard, breaks the "640K barrier" of current operating systems, while maintaining compatibility.

We made improvements to the keyboard and the internal fixed disk drive backup, and developed the COMPAQ Color Monitor that displays enhanced graphics. We added a special feature to the new COMPAQ Enhanced Color Graphics Board that allows high-speed text operation for rapidly moving through large files. We went on to add a host of other features, which taken together, make this the most advanced personal computer available, and the first to offer a true minicomputer level of performance in an industry-standard desktop computer.



The 80386 microprocessor is faster and much more powerful than any of its predecessors.

The winning numbers

The new COMPAQ DESKPRO 386 features advanced, high-speed 32-bit architecture that processes twice as much information as 16-bit computers in the same amount of time. Coupled with a much faster 16-MHz processing speed, it dramatically improves the responsiveness of spreadsheets, databases and networks; the ease of multi-tasking, and the power of engineering software.

Because the 80386 is compatible with today's software, it is setting a clear direction for the future. It preserves your investment in software and training, while allowing the development of powerful new business programs, far more advanced engineering software, and artificial intelligence applications.

No compromises

From the integrity of its components, to its unquestionable compatibility and *connectability*, to its numerous enhancements, the COMPAQ DESKPRO 386 pushes all the limits of advanced technology—with no compromises. It's clearly the computer of choice for today's *and* tomorrow's most demanding users. From the company that has the highest user satisfaction ratings in the industry.

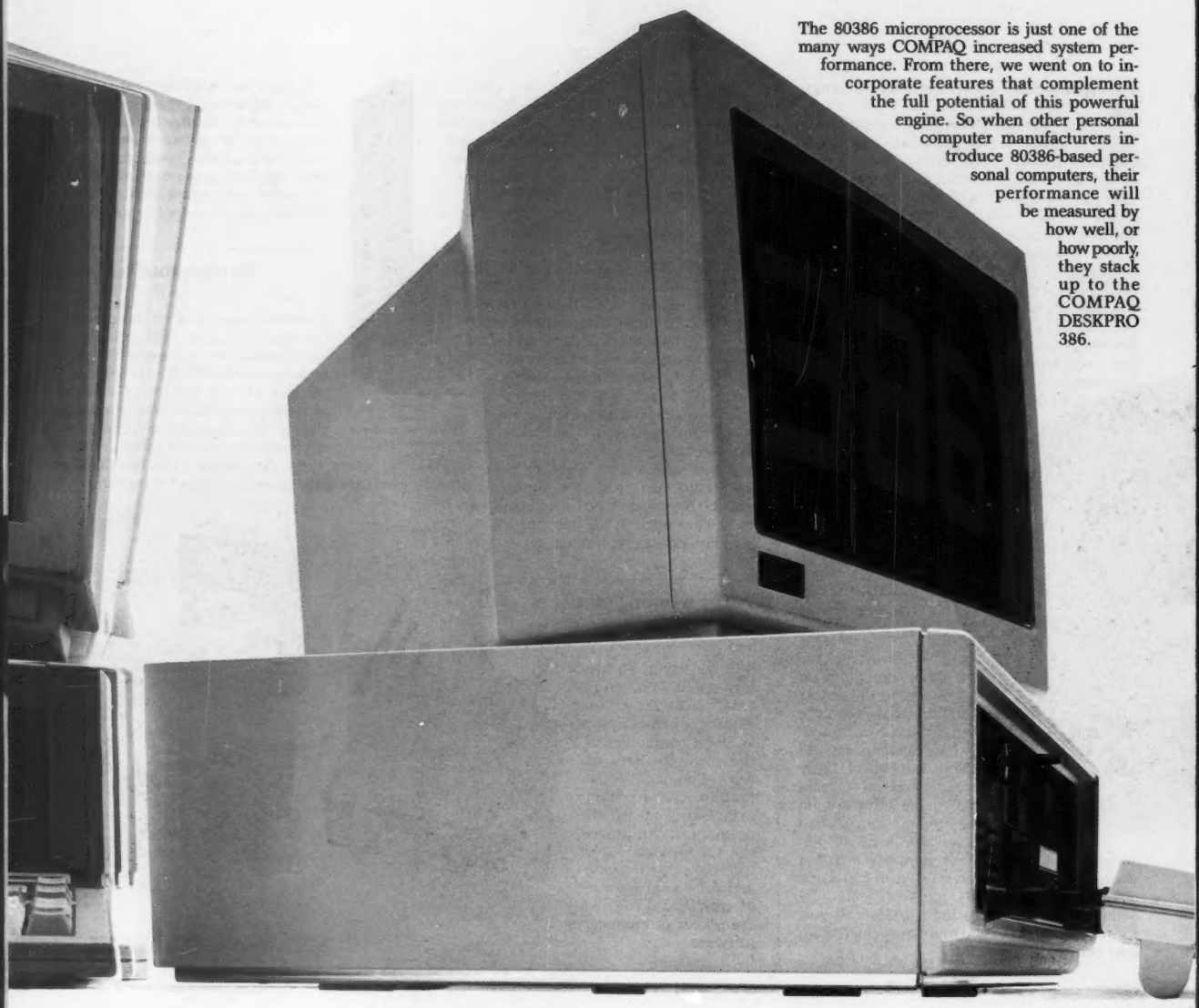
Run industry-standard software 2-3 times faster than ever.

It simply works better.

computer in the world

COMPAQ DESKPRO 386™

Why the COMPAQ continue to be the world's most long after others



The 80386 microprocessor is just one of the many ways COMPAQ increased system performance. From there, we went on to incorporate features that complement the full potential of this powerful engine. So when other personal computer manufacturers introduce 80386-based personal computers, their performance will be measured by how well, or how poorly, they stack up to the COMPAQ DESKPRO 386.

The most advanced personal

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DESKPRO 386 will advanced personal computer copy its engine

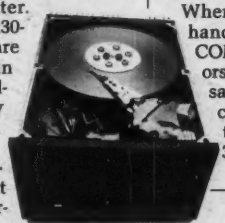
The most memorable personal computer

Break the 640-Kbyte memory barrier and use up to 8 Megabytes of high-speed 32-bit RAM with the COMPAQ Expanded Memory Manager. This software comes standard with the COMPAQ DESKPRO 386 and works with applications that follow the Lotus®/Intel/Microsoft® (LIM) Expanded Memory Specification, allowing you to build bigger spreadsheets, sort larger databases and run more programs. And unlike other personal computers, this feature requires no additional software, and the high-speed RAM uses no expansion slots, leaving more expansion slots for other uses.

Greater stores of knowledge

The COMPAQ DESKPRO 386 provides the most storage capacity and performance available in any personal computer. High-performance 40-, 70- and 130-Megabyte fixed disk drives are 50 to 150 percent faster than those used in other advanced-technology PCs. And they store 5,000 to 50,000 more pages of data.

We also developed a fast, economical way to protect all that data. Using the COMPAQ internal fixed disk drive backup system, you can back up and verify 40 Megabytes of data on a single formatted cartridge at the timesaving rate of one Megabyte per minute—that's four times the capacity and twice the transfer rate of our previous system.



Storage drives access more data faster, enhancing performance.

Specifications

Processor: *32-bit 80386; 16-MHz clock speed; 4- or 8-MHz 80287 coprocessor socket; real-time clock and battery.*

Memory: *One-Megabyte RAM at entry level, expandable to 14 Megabytes; 32-bit memory bus; COMPAQ Expanded Memory Manager.*

Storage Devices: *1.2-Megabyte diskette drive (one standard, second optional); 360-Kbyte diskette drive (optional); 40-Megabyte half-height fixed disk drive (average access less than 30 ms); 70-Megabyte full-height fixed disk drive (average access less than 35 ms); 130-Megabyte full-height fixed disk drive (average access less than 25 ms); internal fixed disk drive backup (40 Megabytes/tape).*

Standard Configurations

Model 40: *One-Megabyte random-access memory (RAM); one 1.2-Megabyte diskette drive; one 40-Megabyte fixed disk drive; three 8/16-bit expansion slots available; three 8-bit expansion slots available.*

Model 130: *One-Megabyte random-access memory (RAM); one 1.2-Megabyte diskette drive; one 130-Megabyte fixed disk drive; two 8/16-bit expansion slots available; three 8-bit expansion slots available.*

Lead a much more colorful life

When combined with the COMPAQ Enhanced Color Graphics Board, the new COMPAQ Color Monitor can display 16 colors at once from a 64-color palette. This same board supports CGA and monochrome display standards and provides the high-resolution graphics—640 × 350—that many users require.

Shifting speeds

Some copy-protected software programs have varying operating speed requirements. So the compatibility experts at COMPAQ engineered the COMPAQ DESKPRO 386 to accommodate them. The microprocessor will *automatically* raise and lower the operating speed when your software requires it—one more way that our attention to detail further insures complete compatibility.

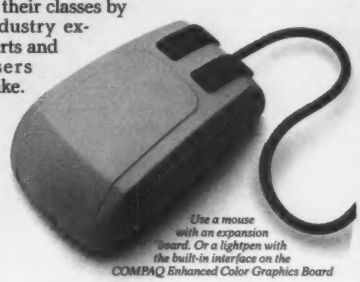
Expanding horizons

Exceptional expandability lets you add as many as four internal storage devices. You can add more RAM, too. Up to 10 Megabytes of RAM can be placed on the system memory board without using an expansion slot; 14 Megabytes using only two. You can also add our Enhanced Color Graphics Board that has a lightpen interface built in. This still leaves four available expansion slots compatible with industry-standard expansion boards. So you can connect to mainframes or minicomputers, in a network, or in a multi-user environment.

Built to higher standards, with "more" standards

We build more into the COMPAQ DESKPRO 386, with more care. Interfaces for printers and modems are standard. We protected storage devices with shock isolation systems. We improved the keyboard to help touch typists avoid mistakes and simplify common chores. *And we offer a full one-year limited warranty.*

Some companies may copy one or two features of our latest computer. But it will be years before they copy them all. That's just one more reason why COMPAQ Computers are recognized as best in their classes by industry experts and users alike.



Use a mouse with an expansion board. Or a lightpen with the built-in interface on the COMPAQ Enhanced Color Graphics Board

It simply works better.

The most advanced personal computer because it incorporates the most advances.

computer in the world

COMPAQ DESKPRO 386™

COMPAQ creates computer that

The COMPAQ DESKPRO 386 is so advanced it will replace many larger, more expensive computers. Thanks to its versatile microprocessor, 32-bit architecture, and faster fixed disk drives, engineers and sophisticated business users will now be doing many things on personal computers once thought impossible or impractical. The new COMPAQ DESKPRO 386 breaks all the barriers of personal computing.

The speed and power of the COMPAQ DESKPRO 386 make it the personal computer of choice for CAD/CAE, networking, and multi-tasking/multi-users.

The most advanced personal

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the first personal thinks it isn't

The better alternative to the dedicated workstation

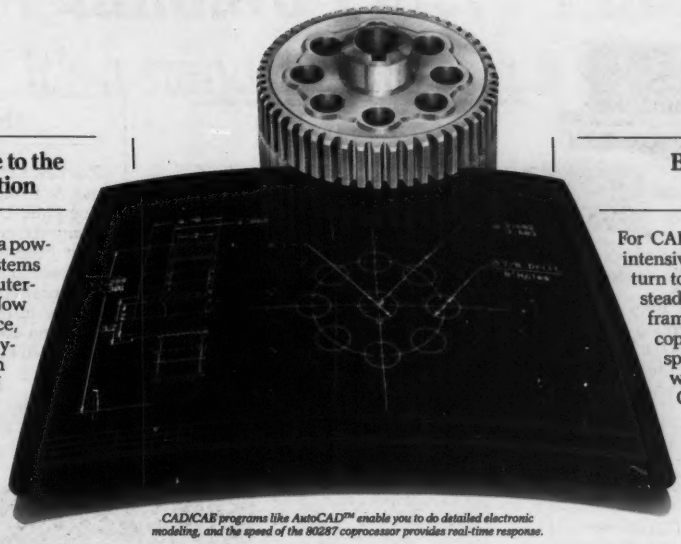
The COMPAQ DESKPRO 386 is a powerful alternative to dedicated systems that do one thing, like computer-aided design, extremely well. Now you can match their performance, and still run hundreds of industry-standard programs as well, with a system costing thousands of dollars less.

A desktop minicomputer?

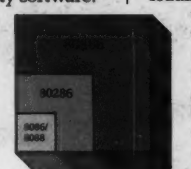
Rapid mass storage access, 32-bit advanced architecture, and a large linear address space allow software developers to easily modify minicomputer programs for use on the COMPAQ DESKPRO 386. Plus, you get a true minicomputer level of performance with your current personal-productivity software.

Net gain

Waiting at a workstation for information to make its way back and forth from a network file server or multi-user host computer can be frustrating. With the COMPAQ DESKPRO 386 as your file server or host, however, you can eliminate those frustrations while enjoying even greater productivity. Your system will run faster than ever. And with greater speed and fixed disk drives that offer more storage, you can handle additional users without overloading your system.



CAD/CAE programs like AutoCAD™ enable you to do detailed electronic modeling, and the speed of the 80287 coprocessor provides real-time response.



The 80386 runs software written for earlier chips and adds more power.

Multi-task master

Sophisticated users who spend a lot of time loading and reloading the different programs they use can benefit from the power of the COMPAQ DESKPRO 386 through multi-tasking. Multi-tasking allows users to run several programs simultaneously—and switch between them. And that capability has never been better than on the COMPAQ DESKPRO 386. Its speed and vast memory capacity make it ideal, especially when running software under XENIX. System V/286 as published by COMPAQ. Its speed and memory also make it ideal for multi-users.

Exceptional speed and memory make the COMPAQ DESKPRO 386 ideal for multi-tasking. You can run several programs at the same time and switch between them.

Building bridges to engineers

For CAD/CAE and other "floating-point intensive" programs, engineers can now turn to the COMPAQ DESKPRO 386 instead of costly minicomputers or mainframes. Used with the 8 MHz 80287 coprocessor option, it gives you the speed necessary for serious design work. In addition, the COMPAQ Color Monitor and COMPAQ Enhanced Color Graphics Board offer resolution required for most graphics applications with a built-in interface for those who use a lightpen. Because of the tremendous cost savings over dedicated systems, companies can afford to provide each engineer a COMPAQ DESKPRO 386 and eliminate the inconvenience of sharing larger computers.

Artificial intelligence

The speed, memory and storage of the COMPAQ DESKPRO 386 now make artificial intelligence in personal computers a real possibility. Soon available, these new AI programs promise to make personal computing even easier than it is now. The COMPAQ DESKPRO 386 is an investment in the future that pays handsome dividends today.

It simply works better.

computer in the world

COMPAQ DESKPRO 386™

History in the making from a company that knows how

At every level of performance, COMPAQ Personal Computers offer more than the competition without sacrificing compatibility.

COMPAQ also includes features not found on other personal computers —like shock-mounted disk drives for greater reliability.

The newest advance in advanced technology incorporates dozens of enhancements. Never before has a computer this powerful fit on a desk.

Very few personal computer companies have managed to gain the worldwide respect and acceptance from computer users that COMPAQ has. You'll find COMPAQ on the approved vendor lists of more FORTUNE 500 companies than any other manufacturer with the exception of one. You'll also find that COMPAQ has the highest user satisfaction ratings in the industry, bar none. That's because we refuse to compromise.

First *and* best

The COMPAQ DESKPRO 386 is the first PC from a major manufacturer based on the new 80386 microprocessor. Its power, speed, performance, and built-in features exceed every other personal computer you can buy. Not surprising from a company with a history of being first with the best.

A long line of firsts

COMPAQ was the first to introduce a full-function portable computer that could do more than most desktops.

We were the first to offer desktops that were faster and more expandable than the IBM® PC.

The first to offer an internal fixed disk drive backup system.

The first to introduce a desktop more powerful than the IBM PC-AT®. And the first to offer an equally powerful, yet *portable* 80286-based personal computer.

One good thing leads to another

The COMPAQ Portable led the company to the most successful first year in American business history. Each successive product led COMPAQ to the Fortune 500 faster than any other company in history. By refusing to compromise, we'll keep making history.

The best from the best

The new COMPAQ DESKPRO 386 is available only from the over 3,000 Authorized COMPAQ Computer Dealers located worldwide. These computer professionals have already proven their expertise in providing computer users complete business solutions to meet a variety of needs. For the Authorized Dealer nearest you, or to obtain a brochure, call 1-800-231-0900 and ask for operator 23. In Canada, call 416-449-8741, operator 23.

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In Depth

Standard Query Language:
It's a standard, but is it a language?

How does SQL handle applications that don't query? • Keeping SQL portable vs. imbedding it in a 3GL • Major weakness: no support for development tools

By STEPHEN GERRARD

The DP industry's tendency to overemphasize the benefits of any technology — the "magic wand" phenomenon — comes to mind when in any observation of the overly exuberant reception given to IBM's SQL, the language of the relational data model. Many in the industry are promoting SQL as more than it really is and are ascribing capabilities to it that it does not possess.

SQL's orginators and the academicians who have made important contributions to its evolution generally are not the ones who tout it as a DP cure-all. While certainly proponents of SQL, they also point out its limitations.

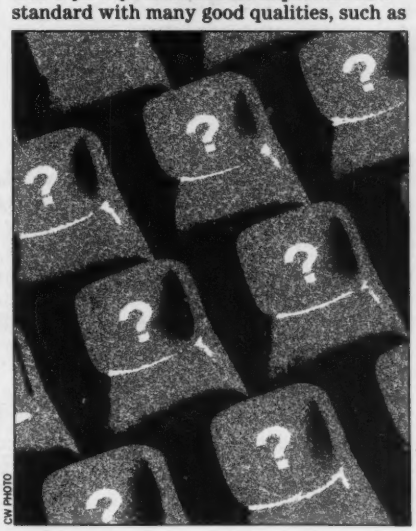
Rather, it is various industry observers, many of whom have never been DP managers, who seem to be the loudest in promoting SQL as a quick fix.

This article will examine SQL not from the academic perspective but from the business perspective of MIS directors who every day must face the productivity crisis. It will consider the important contributions SQL is making to the advancement of data processing.

But also noted will be the "dark side" of SQL — those things that may come back to haunt DP executives who believe SQL really is a magic wand for curing every DP ill.

Important new standard

This article should not be interpreted as anti-SQL. SQL is indeed an important new standard with many good qualities, such as the following:



CW PHOTO

Theoretical foundation. SQL is solidly based upon principles of mathematics and logic. It allows complex data manipulation operations to be represented in a rigorous way. SQL, along with the relational data model, brings a much-needed element of theoretical discipline to the world of data base management systems.

Standardization. SQL, or at least a form of it, is emerging as both a de facto standard and an internationally supported standard for data manipulation. As more emerging software and hardware products embrace SQL, DP managers can enjoy a greater degree of vendor independence than before, at least theoretically. This would seem to imply that all SQL-based applications would be easily portable between different hardware and software systems.

Oddly enough, this idea makes SQL a double-edged sword for IBM. As originators and proprietors of the de facto standard, IBM is in an enviable position. However, SQL is not impossible to duplicate, and the proprietary benefits IBM usually enjoys can be eroded, opening IBM up to effective competition from computer manufacturers that offer SQL-compatible DBMS products.

One note of caution, however: Not all SQLs are created equal. Even IBM's version of SQL for SQL/DS, its smaller relational DBMS, and the SQL associated with DB2 are not entirely the same. Likewise, the IBM implementation with DB2 differs in some respects from ANSI-standard SQL. Managers should be wary of believing that every SQL implementation is automatically the same.

Set processing. SQL allows data manipulation operations to dictate, in one expression, the entire set of records, or rows, involved in the operation. This is much more powerful than the older record-at-a-time methods of coding data manipulation operations.

Set-oriented languages are a big advance in that they permit end users to concentrate more on the business problem — the "what" — instead of forcing them to grapple with navigating through the DBMS structure — the "how."

Set-oriented languages rely on the sophistication of the underlying DBMS to determine the best way to locate requested data. This potential can remove a lot of clutter from the statement of the problem, thus enhancing maintenance as well as initial development.

Distributed processing. SQL is particularly amenable to building applications for truly distributed data bases. SQL could

About the author
Gerrard is vice-president and director of product marketing for Applied Data Research, Inc. in Princeton, N.J.

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play a big role in the eventual realization of this technology, which hitherto has not been widely implemented.

Although distributed data bases are not yet in widespread use, no one denies that they will offer many cost and function benefits not available today.

SQL maintains the necessary foundation to operate in a distributed environment. Tables in a relational DBMS are quite easy to divide, and SQL already employs operations to join them back together — whether they reside on one CPU or many.

Easy and elegant

SQL possesses other positive qualities. It is certainly easier to learn, at least at the basic level, than older, hierarchical data manipulation languages, and it is far more elegant, being coupled with the underlying relational data model. A major contribution of SQL is that users need not specify access paths and navigation to access desired data.

Incidentally, it has been observed that the relational data model is, in reality, the first data model. Older DBMS evolved according to somewhat idiosyncratic, specialized needs and were not based upon a formal model. The evolution of these systems without a formal model's guideposts has made their ready support of a language like SQL impossible. This is one reason why older DBMS with "relational views" continue to suffer from deficiencies in their languages.

Inverted-list systems, on the other hand, although not relational in their origins, are much easier to bring into an SQL world. This is because these systems, like relational DBMS such as DB2, use an index to access data records, although the index keys must be specified in inverted-list DMBS operations, whereas in relational DBMS the index is invisible.

But many inverted-list DBMS have had set-processing languages and have supported operations typical of relational DBMS (like JOINs) for years. The task of adapting such systems to use SQL is not at all as difficult as it is for a hierarchical or Codasyl DBMS.

A positive new force

With all of the above going for it, and particularly with IBM's backing, one may wonder why SQL is not the long-awaited quick-fix solution to the DP productivity crisis. Indeed, SQL is a positive new force. But by itself it does not address the full spectrum of issues pertaining to the productivity crisis.

To be fair, some of the issues covered below are beyond the scope of present SQL research and implementations. But for the DP executive who looks upon SQL as an application development cure-all, they constitute the dark side of SQL.

The primary emphasis in SQL research has been to create an academically sound, complete data manipulation language (DML) and data definition language (DDL). As a result, the major orientation in SQL implementations has been query operations — as the name SQL implies.

What this means is that precious little thought has been given to the larger issues of application development, other than that of embedded SQL. These other issues are much broader than query operations.

In SQL, there is no concept of a program — that is, a business problem expressed in a programming language with statements, some of which manipulate data bases but others of which do other important things. Any elements of a program that are

> ***In SQL, there is no concept of a program — that is, a business problem expressed in a programming language with statements, some of which manipulate data bases but others of which do other important things. Data manipulation and definition are the only important operations.***

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not reduced to tables in a data base (screen handling, process logic, computations, report control) are not addressed by SQL. In SQL, data manipulation and definition are the only important operations.

Compare SQL — simply a DML and DDL — with the range of features a full language must address. Complete application development languages must allow for logic constructs such as IF, LOOP and CASE statements; a full range of computational statements or features; CALLs of subprograms with parameter passing and so on. In short, a way must be found to express the logic of the business application. This requires numerous facilities not present in SQL, so the only way to gain access to them is by embedding SQL within a foreign language.

A major weakness of SQL — from an application development, not a theoretical, standpoint — is its lack of support for working data. In Cobol, this would be analogous to the term "working storage." With SQL, the only way to manipulate temporary, intermediate data values is to create (and later drop) a data base table to contain those values. But that is a very expensive way to manage temporary data. This is not an esoteric point: The need for working data is a very real business application problem faced by the majority of programs.

The query orientation of SQL is great as far as it goes. But DP executives need to be cautious about assuming that SQL is suitable for developing applications that require many facilities not found in query systems.

Embedded SQL

Granted, working data can be utilized when SQL is embedded into a Cobol or PL/I program. This simply underscores the point: SQL *by itself* is not a full programming language and must be embedded in older, second- or third-generation languages in order for the developer to gain access to those facilities SQL lacks.

Embedding SQL statements into Cobol or PL/I programs results in, at best, 3.2- to 3.4-generation productivity, but certainly not fourth-generation productivity. Programs with embedded SQL bear little resemblance to fourth-generation programming languages. Programmers must learn two languages and switch back and forth between them.

If researchers were to sit down and design a full application development language based upon SQL, it would not end up looking anything like what we see today with embedded SQL. The embedded SQL approach was convenient because Cobol and PL/I were already there and because addressing the fuller range of application development features would have required broadening SQL research beyond the scope of the relational data model.

For this reason, we are now witnessing a new wave of application development products that claim to "extend" SQL by placing the missing language capabilities and application development tools on top of the basic SQL language. This is an important and valuable industry trend because it holds the potential of delivering true fourth-generation application development products without throwing out or ignoring the theoretical benefits SQL offers.

Embedding SQL into PL/I or Cobol even forces some clutter to be required in the SQL statements themselves. Cursors are necessary to establish one's position in the different rows of a set, which many SQL purists believe detracts from SQL's elegance. In addition, SQL, it can be argued, detracts somewhat from the elegance of the language used to house it. The resulting program turns out to be a mediocre solution from the standpoint of readability and subsequent maintenance.

In their present state, products built upon SQL, such as DB2, simply are not designed for transaction processing applications. They often do not run, or run very clumsily, in IBM's CICS, the most common transaction processing environment. They reflect a "conversational" approach and do not easily lend themselves to the resource conservation demanded by transaction processing applications. These products have a long way to go before they will be used for wholesale application development in a transaction processing environment.

One should beware of claims that certain products are used in production

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> ***Imbedding SQL into PL/I or Cobol forces some clutter to be required in the SQL statements themselves. In addition, SQL detracts somewhat from the elegance of the language used to house it. The resulting program turns out to be a mediocre solution as far as readability and maintenance.***

applications. Are these production applications doing transaction processing, or are they more oriented to query processing? Often, an application may be characterized as production just because it is used every day, not because it has the attributes of a traditional, heavy-duty operational DP system.

How portable is it?

One of the strengths of SQL is its emergence as a standard. We mentioned earlier the promise of portability this offers to DP executives. But is this promise actually delivered?

In reality, only queries written in SQL stand a real chance at portability. Remember though, ANSI SQL does not equal DB2 SQL, which does not equal SQL/DS SQL and so on. More important, if we consider the nature of applications written in imbedded SQL or some other language, we see a different picture. Not all versions of Cobol, for instance, are easily portable among hardware systems.

Additionally, approaches to screen management, report creation and program creation vary widely between environments. Often a particular program may involve other preprocessors, such as those for command-level CICS, that may not have counterparts in other environments.

Although SQL itself may be close to portability, this does not mean that applications with embedded SQL statements are close, too.

Nonlanguage issues

A good point to remember is that data bases exist because of applications, not vice versa. SQL, as a data manipulation and definition tool, should not be positioned as a full application development facility.

When looking at an application from the standpoint of the business problem to be solved rather than the viewpoint of DBMS theory, numerous nonlanguage application development issues can be identified that need to be addressed to achieve maximum productivity.

Full application development systems require facilities for defining and modifying screen layouts. Also needed are facilities for defining and formatting reports and a full data dictionary to house not only data base and view definitions but also all the components of the full application: its jobs, steps, programs, screens, reports, submodules and authorization levels. These items are all beyond the realm of SQL today.

When relational DBMS theory is viewed from an application development view, a major hole that appears is the lack of attention to data dictionary support. One prominent relational DBMS academic, in discussing the shortcomings of some relational offerings, states that the DB2 catalog could easily be extended to become a more full-service data dictionary. This, however, is simply an attempt to explain why such an important part of an application development environment is unaddressed by relational research.

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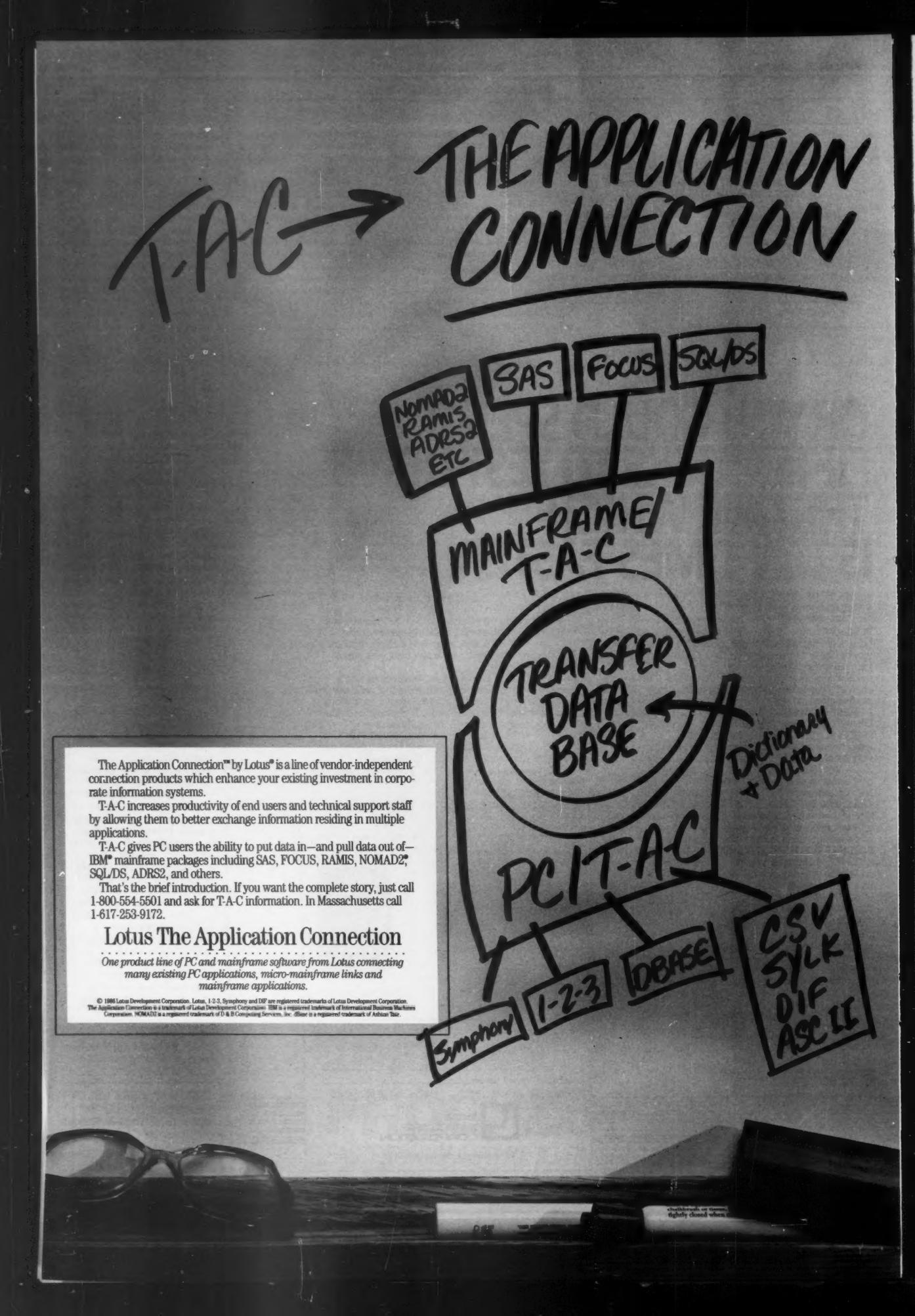

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that is, the on-line environment in which the developer works.

Included are facilities such as split-screen operation, intelligent editors, prebuilt language templates, alternate command and menu operating modes, Help and tutorial aids and other facilities designed to make the applications developer as productive as possible while working on-line.

A final practical issue is that of migration to SQL. There is no realistic way to use SQL with existing applications, which means that the applications must all be rewritten before the benefits of SQL and relational theory will apply to them. That is expensive. But since there is no rigorous way to reconcile these prerelational applications with SQL, this problem will persist for IBM users.

It is valid to argue that the items contained herein under nonlanguage issues are rightfully outside the realm of SQL and that, therefore, SQL should not be criticized for not addressing them. To this we would agree, as long as SQL is not being promoted as a total application development solution. Otherwise, these issues cannot simply be disregarded — they are critical to the programmers and analysts who must develop the applications.

Academic orientation

We come now to perhaps one of the most sensitive areas of SQL's dark side. Even though the mathematical and academic origins of SQL have been noted above as a primary underlying strength, I nevertheless also include these origins as a weakness.

Why? Simply because most end users do not have a Ph.D. in mathematics and logic. Although some end users can learn SQL to perform very simple queries, using it for more complex operations is beyond their grasp. One has only to look at the series of examples used in textbooks on SQL to find out why.

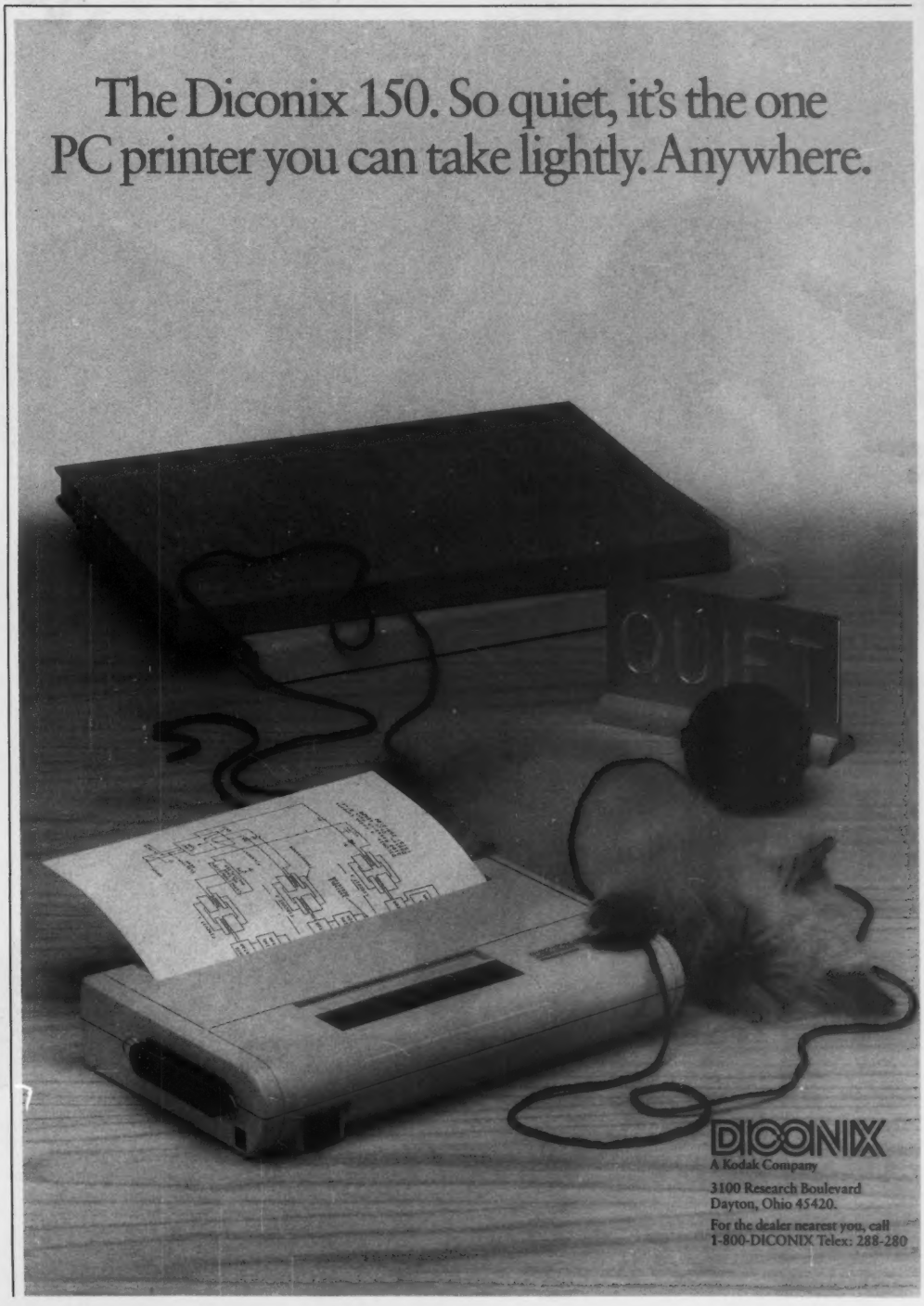
Most people — end users and DP professionals alike — who read these examples find it far easier to understand the free-form English explanation of the queries rather than understanding it from SQL itself. If you have access to such a text, try this simple test: Read the SQL statements before you read their English explanations and see how many times you get the operation right.

Because of the academically precise nature of SQL, end users often invoke operations they did not mean to invoke. This raises the distinct possibility of inadvertently consuming large amounts of computer resources — or worse: People can believe they are asking for one thing whereas SQL thinks they are asking for something entirely different — which leads to the typical problems of data misinterpretation and, hence, misinformation.

> ***An application may be characterized as a production application just because it is used every day, not because it has the attributes of a traditional, heavy-duty DP system.***

Debate on this point could rage forever. It may indeed be the case that expressing every last esoteric data manipulation operation is not possible without a language as precise, rigorous and comprehensive as SQL. But it may also be the case that the vast majority of end users do not need to perform the more esoteric functions that SQL supports. For these users, more friendly alternatives have proven far more productive and useful.

A simple comparison of SQL with another commercially available query language (see chart page 81) shows why SQL may be a bit too mathematical for end users. In the example, both statements perform the same business function, but the alternative is definitely easier to grasp, although it is perhaps not as precise. For this reason, IBM and other vendors offer end users more



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friendly front ends to SQL designed to protect the user from the difficult nature of the SQL language. An example would be IBM's Query Management Facility.

So while SQL's strength is due largely to its academic completeness and attention to rigor, the language suffers from a certain amount of unfriendliness, requiring a more highly qualified end user in order to get reliable results. This contrasts with the decided trend toward greater ease of use in programming languages today. Of course, SQL is much easier to use than the old Codasyl DMLs; it does not compare so favorably with some modern fourth-generation languages, however.

> ❞
>
> ***While SQL's strength is due largely to its academic completeness and attention to rigor, it suffers from a certain unfriendliness, requiring a highly qualified user for reliable results.***

SQL suffers somewhat from the "creeping complexity" syndrome. Although coding a very simple query in SQL is quite easy, as the complexity of the query increases, the language statements often become too difficult for most end users to handle.

This is why SQL is sometimes used successfully by end users, while in other instances it is not. Although complex operations are fully supported in SQL, the code to express them is much more difficult to understand and to maintain than it is in some of the other languages that are currently available.

Foundation with limits

SQL is an important language and an emerging standard of the future. It has made many positive contributions to the DP industry already. In this look at the dark side of SQL, we can note two important concepts to remember:

- First, understand what SQL addresses and what it does not. Do not fall into the trap of considering SQL as a full-blown application development system. Some overly exuberant industry analysts have erred in implying that SQL can solve the application backlog .

SQL is only a DML/DDL, not an application development system.

By itself, SQL offers no facilities for screen management, report definition, data dictionary support, workstation concepts or program logic constructs. All of these items are vital to the job of application development today, and the application backlog cannot be dramatically reduced without paying attention to them.

DP executives who ignore this lesson will only suffer grave disappointment later when SQL fails to live up to the too-high expectations placed upon it.

- Second, SQL in its present form is far more suited as an internal DML for fourth-generation and relational DBMS products than as the direct language for all users. In the same way that most DP professionals do not work directly with protocols such as VTAM, Systems Network Architecture or LU6.2 in building applications, so too will SQL become a sort of relational DBMS protocol.

In the future, end users will want internal SQL support within a DBMS but will undoubtedly choose to use languages more appropriate to applications development as the external statement of the business problem being processed.

SQL, when married to the much higher level fourth-generation languages currently available, can provide that important foundation of standardization that many desire.

But at the same time, much friendlier languages and facilities can be used to accomplish the real business of DP organizations — the quick construction of production applications upon which their enterprises depend. ■

SQL: Too mathematical for end users?

Problem: Find supplier names for suppliers of red parts

Solution in a generic SQL

```
SELECT SNAME
FROM SUPPLIERS
WHERE SUPPNUM IN
    (SELECT SUPPNUM
    FROM SUPPLIER-PART
    WHERE PARTNUM IN
        (SELECT PARTNUM
        FROM PARTS
        WHERE COLOR = 'RED'));
```

Solution in an alternative query language

```
FIND ALL SUPPLIERS
        RELATED BY SUPPNUM TO SUPPLIER-PART RECORDS
        RELATED BY PARTNUM TO PARTS RECORDS
            WITH COLOR = 'RED'
PRINT FROM SUPPLIERS SNAME
```

Comparing SQL to other commercial query languages highlights its formal, mathematical quality. In this example, SQL's cryptic notation style does not yield fewer lines of code, but it may make software maintenance a tougher job.

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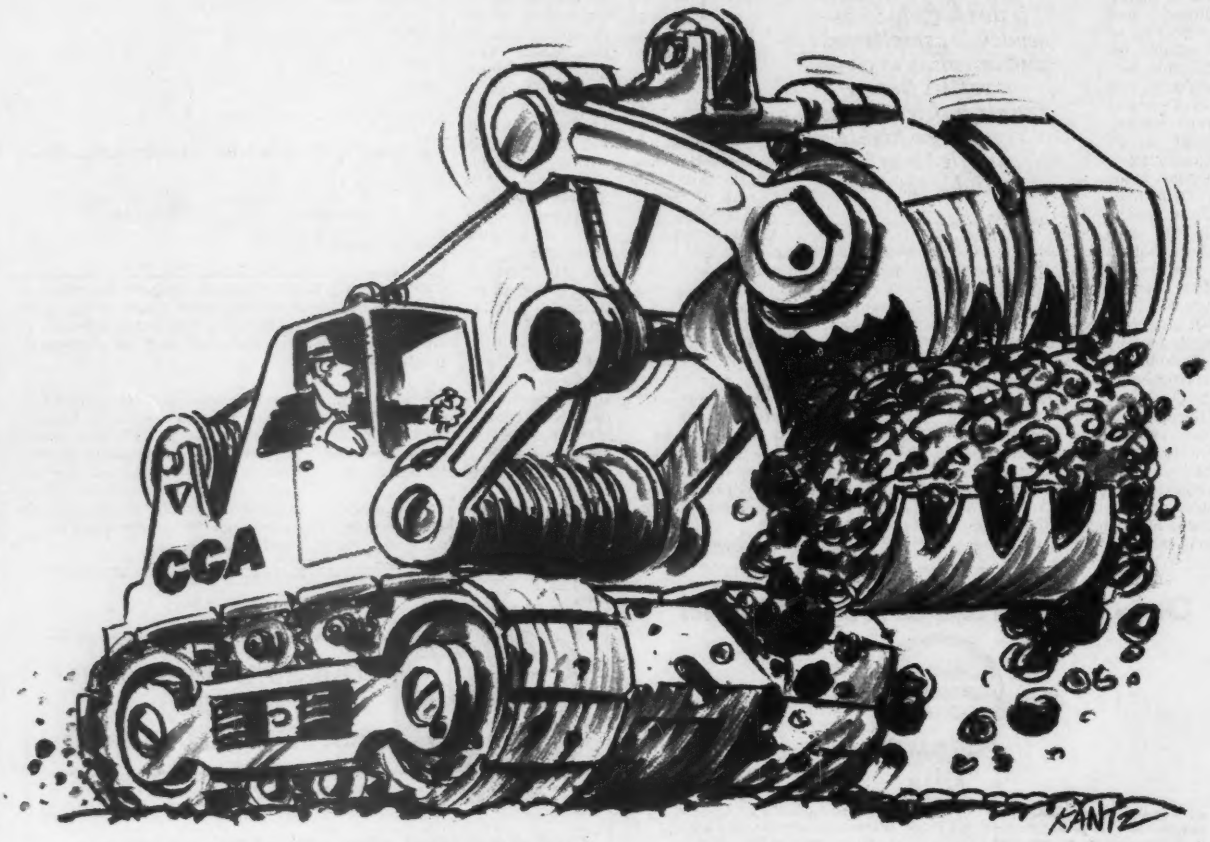

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In Depth

American Bankers Association:

Low-cost messaging links members instantly

By DON KAZEMZADEH

Executives of the American Bankers Association (ABA) know the frustration of playing telephone tag. Needing to communicate crucial legislative information to their peers across the country, these officials have instead often found themselves talking to office secretaries or automated answering machines.

Communication problems like these can be detrimental to the association's ability to lobby for or against important legislation. Effective lobbying is often a matter of responding in minutes or hours, not the day and a half it takes for some executives to return phone calls.

To resolve this problem, the association conducted an extensive search for an effective communications system. The search resulted in a system based on modems connected to IBM Personal Computers running Western Union Corp.'s Easylink Instant Mail Manager communications software.

> ***The most impressive feature of all is seeing the system successfully transmit messages even when the PC at the receiving end is turned off or is running another application.***

Each state association and the national office of ABA subscribe to the Easylink service and use the modems and PCs to allow instant communications.

Now executives can exchange information about current issues as soon as the latest developments are known. The new system not only solves their old problems but provides some unexpected benefits as well.

Daily communications

In addition to lobbying efforts, the association uses the system to keep its members informed about the impact of new legislation on the commercial banking industry. ABA and state association executives work together on a daily basis, discussing their government relations activities and exchanging general banking news.

ABA's councils and committees determine the commercial banking industry's position on federal regulations and on legislation proposed to Congress. With members in the 50 states, Puerto Rico and the District of Columbia, the association's goal lies in maximizing the industry's ability to compete effectively and profitably in the financial services market.

The first step on the road to the ABA's selection of a communications system began with telex. A system was installed initially that transmitted ABA messages via telex to state associations, where they printed out on telex machines. The system worked relatively well, but there were a number of pressing problems.

Telex flaws

First, telex line is expensive, and some of the state associations were unable to keep paying for it. Furthermore, to send a message by telex, each office needed a telex machine available plus a telex operator on hand.

In addition, communications were limited, for the most part, to one-way messages. Technically, the state associations were able to send a message back to the ABA, but practically it was very hard. Thus after receiving the messages, the state associations still went through the process of calling the ABA to discuss their content.

There were also some mechanical problems with the telex machines, like the paper running out in the middle of a message. Last, anybody who has ever used a telex machine knows how much noise it makes when it is printing, and God forbid if it starts running while you are on the phone and the machine is nearby. This was a major problem for the office personnel.

The state associations asked the ABA to look for a better system that was cheaper to operate and less noisy. As ABA's business systems analyst, I was assigned to this project, called the State Association Urgent Message Delivery System, which is now for

PHOTO COURTESY OF AMERICAN BANKERS ASSOCIATION

ABA's Nora Cavanagh and Don Kazemzadeh work through messaging menus on an IBM PC.

Kazemzadeh is a business systems analyst for information systems at the American Bankers Association in Washington, D.C.

evolutionary reasons referred to as the Electronic Mail Delivery System.

After interviewing the users, I compiled the following list of requirements for an ideal system:

- The state associations should be able to send urgent messages to one another, as well as to the ABA, and the ABA should be able to send messages to the state associations.
- The executives at the receiving end should be informed of the arrival of a message.
- Messaging should be simple and self-explanatory, because some of the end users have no computer experience or have only worked with word processing software.
- The system should be economical to use. The maximum amount that the smallest state association could afford to spend was $600, so that amount was set as the budget for the total system installation cost at each association office.
- Since most state associations have IBM Personal Computers, they should have a system that would work in conjunction with a PC, thereby keeping the cost of messaging down.
- The most difficult requirement: When a message arrives, it should not interfere with the tasks that might be running on the PC.

Possible solutions

Since the state associations are located throughout the country, it was obvious from the beginning that whatever the system, I had to find a replacement for messaging across standard telephone lines or the operations cost would have been high.

This was the point at which I started thinking about sending the messages through one of the public telecommunications networks. Because the networks have local-access numbers around the country, they charge a cheaper connect-time rate than the phone companies do for long-distance calls.

For example, the Easylink network charges a flat 50 cents per connect minute, regardless of where the message is being sent. Long-distance phone rates are more expensive because they depend on the distance and the time of day that the connection is made.

Most of these public networks have the capability to accept a message and forward it to another location by dialing the telephone number of the receiver and then dumping the message.

This method is called store-and-forward, referring to the way the message is accepted and then transmitted to another location. Typically, it takes anywhere from one to four minutes for a message to be delivered.

Of course, at the receiving end, the call should be answered by some sort of an autoanswer equipment. The telecommunications companies call this service "autodelivery," combining a store-and-forward system with autoanswer equipment.

Vendor proposals

I contacted a number of telecommunications networks and hardware vendors and asked them for any solutions they could suggest for the ABA's problem. The following is a summary of all such proposals the ABA received, without mentioning vendors' names:

Dedication of a telephone line, a printer terminal with an autoanswer modem and direct delivery of the messages by a telecommunications network.

This solution took care of direct transmission problems and the telex line, but we still had the following problems: The equipment needed was expensive, and two-way communication would not have been easily possible.

> ***Anybody who has ever used a telex machine knows how much noise it makes when it is printing, and God forbid if it starts running while you are on the phone.***

In short, it was a different version of the telex, albeit far less noisy.

Dedication of a telephone line and a PC. The PC runs communications software in the receive mode at all times, while the messages are delivered by one of the telecommunications networks.

This solution demonstrates one giant drawback. Mailbox services offered by the telecommunications companies I mentioned above provide an analogy. If so desired, the companies will assign a mailbox to each user. All the mail that is sent to that user will be delivered to his mailbox. Of course, the user has to have a terminal and a modem to call up the mailbox every day to check for messages. The problem with this mailbox system is that the user never knows when he has a message waiting to be read.

Ironically, this solution resembles the mailbox service, because there is no way to tell when there is a new message in the PC waiting to be read. This means that users must check the PC instead of their mailbox, unless they dig deep in their pockets to buy a PC and dedicate it to the task of displaying incoming messages.

You can tell that the price put a sudden end to this solution.

Dedication of a telephone line, use of multitasking software and the respective controllers to enable a PC to receive messages while running other tasks.

This solution was proposed by another one of the manufacturers, and it was the most expensive of them

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all. It called for $22,000 per state association, with, of course, the ABA buying some hardware. Besides, the multitasking software to this day has not been released, and who knows when it will be. Above all, this system still has no way of letting the human operators know that a new message is waiting to be read.

This solution was the exact same as the mailbox service offered by the telecommunications networks, except that it was $22,000 per subscriber. I won't tell you what was done to that proposal.

System design

None of the proposals seemed specifically suited to my requirements. While evaluating the vendors' proposed solutions, I developed the following specific system design, which would suit the requirements above:

- An autoanswer device to automatically answer incoming calls.
- Some form of memory to store the incoming data.
- A means — either visual or audible — of alerting users when their PC receives a new message, so no device has to be dedicated and so users need not continually check a mailbox.

I tested various autoanswer devices and settled on an intelligent modem, called the Promodem 1200, made by Prometheus Products, Inc., of Fremont, Calif. The Promodem 1200 combines a 1,200 bit/sec. modem with autodial and autoanswer capabilities and a buffer.

It can be set up to answer the incoming calls — with autoanswer — and save all the incoming data in a buffer. It indicates when a new message has been received by displaying "Message Buff" on its own alphanumeric display.

The unit's maximum buffer capacity is 512K bytes. By conservative estimates that is the equivalent of 256 pages of text — plenty for the typically short messages sent by ABA members.

This modem can also perform a host of other functions. It will place calls in an unattended mode, independent of the PC — while the PC is turned off or is running another task. It supports a permanent clock and telephone directory, and it stores user-programmable macros — command routines — for further use. Last, the modem doubles as a computer security device with two levels of protection: password protection and callback.

I tested the Promodem with the autodelivery service from a few of the telecommunications companies, and I was most impressed.

The most impressive feature of all was that the messages were being successfully transmitted even when the PC at the receiving end was turned off or when it was running another application.

Having found a satisfactory modem, I was able to formulate the complete scenario:

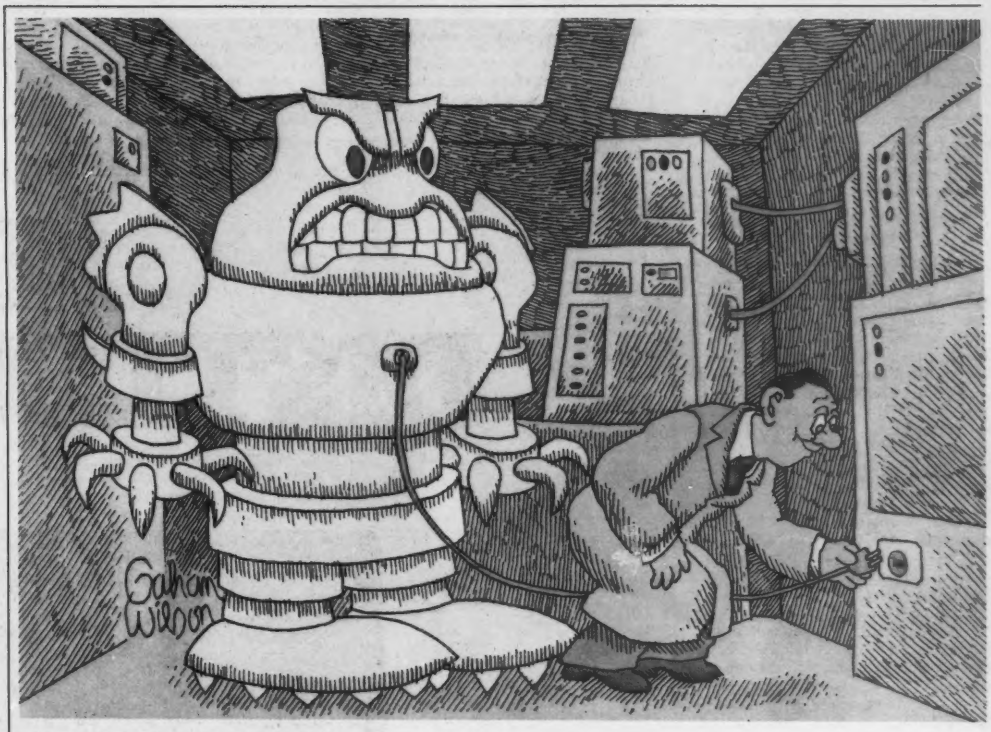
The sender originates a message by calling the local-access telephone number of one of the telecommunications networks and transmitting the message to the network.

The network then calls up the dedicated phone number of the target PC and delivers the message to the buffer of the intelligent modem at the other end. As a result, the "Message Buff" light at the receiving end turns on.

The target user notices the "Message Buff" light and takes the necessary action.

In addition to testing the Prometheus product, I also tested the combination of a Hayes Microcomputer Products, Inc. Smartmodem 1200

> ***Although I had a system that satisfied all the functions technically, I still had one problem. Some of the people who had to use this system had no computer experience, and there I was, talking about dumb terminal emulation and issuing modem commands.***



Some people just ask for trouble.

Isn't it amazing just how many people go around asking for trouble?

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They're running the risk of a misplaced DD override, an invalid concatenation, or some other equally obscure JCL error bringing the whole kit and caboodle to a screeching halt.

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Still, some people are destined to find these things out the hard way.

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Yes, I want to stop living dangerously.

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☐ Have a representative call me.

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TITLE

COMPANY

ADDRESS

CITY

STATE ZIP

PHONE OPERATING SYSTEM

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Triangle Software Company

If you don't ask for us, you could be asking for trouble.

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and that company's Transet 1000 print buffer. I had the Smartmodem 1200 answer the calls in the autoanswer mode and store the incoming data in the Transet 1000 unit. The Transet 1000 print buffer has a red LED indicator that lights when a new message has arrived. This combination also worked independently of the PC.

But this combination was not compatible with sending the messages through a telecommunications network. Transet 1000, the buffer, is basically designed to act as an answering machine for computers. It will allow a caller to leave messages or view the existing messages, but all of this is only possible *after* the caller inputs the correct password. None of the telecommunications networks and services that I looked into could dialogue with the receiving unit before dumping the message. This meant that the Hayes alternative could only be used to send messages directly, not through an autodelivery service.

Other variables

I then proceeded to search for the other variables to my system: the communications software package and the telecommunications network. Communications software would fulfill the two requirements for communications between the PC and the telecommunications network for transferring messages and for communications between the PC and the modem.

The first issue is simply a matter of enabling the PC to communicate with a remote host. This can easily be done by any of the available communications software packages.

The second issue is a bit more complex. Since the Prometheus unit has a processor in it, it acts like a remote host when connected to a PC. Therefore, I had to use a communications package to make the PC talk to the modem. By emulating a dumb terminal, the PC issued direct commands to the modem in its own language to retrieve the messages out of the buffer.

Although I had a system that satisfied all the functions technically, I still had one problem. As I mentioned before, some of the people who had to use this system had no computer experience, and there I was, talking about dumb terminal emulation and issuing modem commands. It seemed that the end users and the proposed system came from opposite ends of the spectrum.

I had to find a communications software package that could be modified and manipulated to meet my specific needs. I needed to customize the package for the proper modem commands and for an optimal user interface.

I tested a great number of packages and found Easylink Instant Mail Manager to be the one that I was searching for. It is distributed by Western Union and is developed by Kensington Microwave, Ltd.

This software, in addition to being a full communications package with broadcast list capability, has a word processing function within it. It is designed to be customized, and I took full advantage of that characteristic.

I was able to configure a menu with the following options:

- Send message to ABA.
- Send to others (to send to other state associations).
- Read messages.
- System checkout.
- Purge messages.
- Need Help message (to send an "I need help" message to me).

Aside from these menu options, the rest of the messaging process, including logoff from the network, is done automatically.

A word processing program included in the software allows users to automatically switch to another menu, which offers the following capabilities: reading a message and saving it on either a floppy or hard disk or reading an incoming message, adding your own comments and sending it to another target.

The telecommunications network

To choose the telecommunications network, I tested and evaluated a number of these networks, their services and prices. We chose the Easylink service for the following reasons: ease of use, the ability to send telex messages worldwide, the ability to interface with IBM Professional Office System (Profs) messaging system, plus several other services and data bases.

The Profs interface was important, since ABA executives are currently using Profs to communicate with one another. As a second phase to be completed early next year, the two systems — Profs and this messaging system — will be connected.

Easylink, working through the modem, has the capability to check for an answerback at two points: upon initial contact — before submitting the message to the storage area — and after delivering the message — before hanging up. Therefore, Easylink makes sure that each message, in its entirety, is delivered to the appropriate target.

Cost matched budget

The final cost for the hardware and software needed is only slightly more than my $600 budget per state association, including the shipping charges for the modem, cable, manual and software. Of course, the subscribers will be charged a subscription fee by the telecommunications network.

In our case, it is $25 per year, plus charges for the use of the system. Easylink's rate is on the order of 50 cents per minute of connect time. Associations use the system to send anywhere from $1 to $2 worth of messages a month to $10 to $15 worth, with the larger associations using the service more frequently than the smaller ones.

The most impressive feature of

MEET DISTINGUIS

3 paper feeding controls, plus paper-saving push/pull tractor feed.

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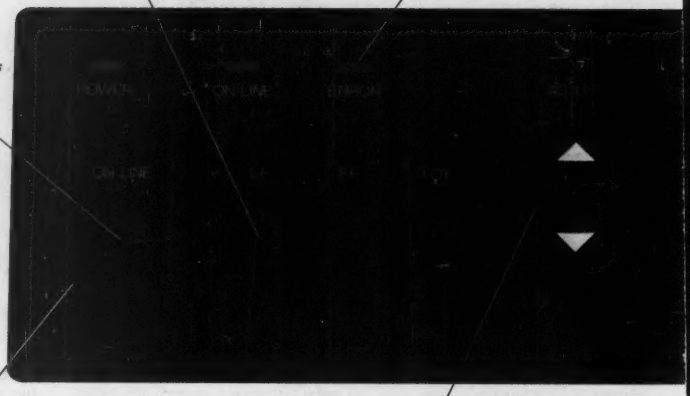
Go off-line to change type styles and modes without lengthy software commands.



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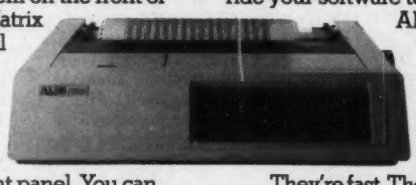


All while using your PC for other work at hand.

But of course, Alps printers are more than a bunch of buttons.

They're fast. The new P2100™ prints drafts at an amazing 400 cps, the

this system is that it does not require any complicated hardware, only an IBM PC or compatible. Along these lines, it could be implemented for any other organization that has PCs in place.

Installation and technical support

I had to assume minimal computer knowledge on the part of users from the initial stages to the installation period. I wrote a basic manual that covers what all users have to know to successfully operate the system. It covers all stages from initial connection of the modem and PC to trouble-shooting.

Even though the manual is very easy to follow, I have made a practice of calling each state association and walking the staff through all the menus for the initial installation. Typically, this process has taken anywhere from 30 to 90 minutes.

> ***Initially, this system was designed to send time-dependent messages on a daily basis. Now, in some instances, our executives are using it to forward documents and material that otherwise would have been sent by one of the overnight mail services.***

In the beginning, all state association users had been given one of my business cards and told to tape it to the modem. "Whenever you have a problem," they were assured, "call this number."

Soon after a few state associations were connected to the system, the burden of technical support became a problem, especially with the ones who wanted to use the different data bases and services that are offered by Easylink.

So I thought up the "Need Help" option and incorporated it into the menu. Whenever the users need help, they can choose that option, and a Need Help message will be sent to the Prometheus unit in my office.

This Help message system saves the associations time because they can send a Help message in five seconds and avoid long-distance telephone calls. The message system also helps me manage the technical support by allowing me to schedule my time more efficiently based on the number of responses and the rest of my work load.

Because of the urgent nature of the messaging system, I respond to these requests for help on the same day that I receive them and in many cases within an hour or two of the message arriving at my office.

This system is more efficient than the telephone, because if several users were calling at the same time, I could not help them all.

Progress report

We looked at two strategies for setting up accounts for the subscribers to this system: having all of them as subusers under our own account number and establishing independent account numbers for each state association.

It was purely a management decision to choose the second option to set up independent account numbers for each subscriber association. Otherwise, we would have had to bill each subscriber under our account for its usage; this alone would have been costly.

Our management gave us the green light in January, and the first state association was connected the third week of March.

To date there are 14 state associations connected to the system, and the number is growing every week. We have scheduled seven more to be connected in the next two weeks. We anticipate having most of the 52 state associations connected eventually.

At this time the response has been encouraging. There is also talk of having another organization that is related to the banking industry connected to the system. It has about 150 member locations.

Supplanting overnight carriers

Initially, this system was designed to send time-dependent messages on a daily basis. Now, in some instances, our executives are using it to forward documents and material that otherwise would have been sent by one of the overnight mail services. This new alternative is convenient, and the system delivers the material to the destination for a fraction of the cost.

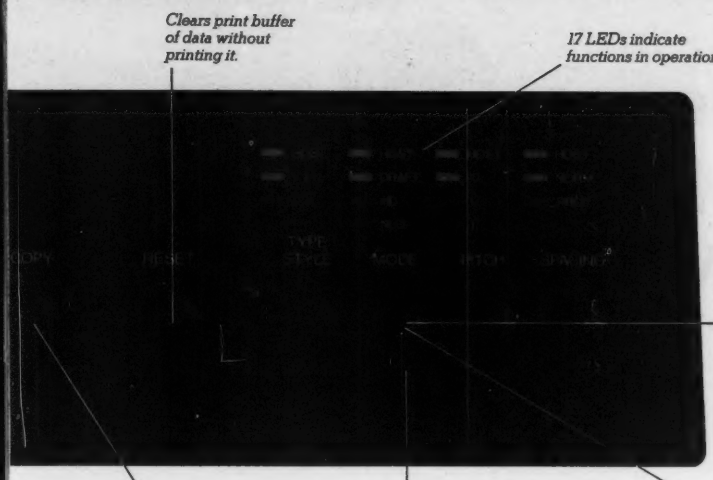
The cost of overnight mail services is a minimum of nearly $10 — often much more — whereas the Easylink charge is 50 cents per minute of connect time. For the kind of documents we exchange, transferring files at 1,200 bit/sec. costs far less.

The need to exchange messages rapidly and economically extends well beyond the banking industry. This system answers that need through the use of personal computers, which are found in most large companies today.

The system enables end users to send electronic mail directly to specified targets as well as to notify the recipients of the incoming message.

The beauty of it is that the messages can be transmitted and received while the receiving PC is running different software or even when it is turned off. The system can easily be implemented by any organization with an installed base of IBM or compatible PCs. ■

OUR HED PANEL.



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The Director of Data Processing, John Zebracki adds, "By maximizing access to our central files, we manage the use of PCs, and at the same time streamline operations in such critical departments as Fire, Police, Water, Engineering, Collections, and Inspections."

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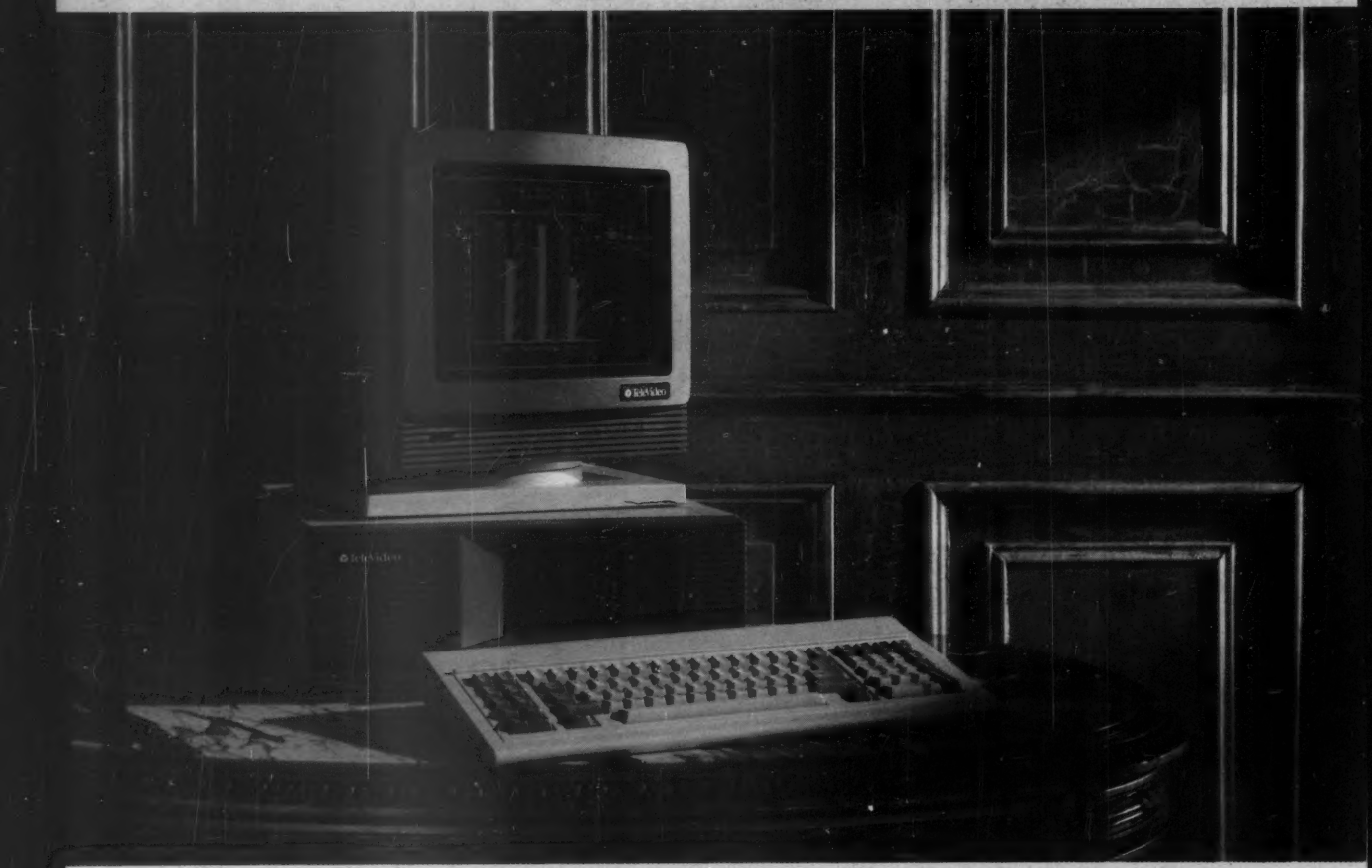

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MANAGEMENT

TAKING CHARGE
Patrick P. Ragozzino
and Janice J. Pallenik

Selling quality assurance

The installation of a quality assurance function for information systems does not eliminate problems or inefficiency. However, it does provide a systematic way of determining whether processes to reduce inefficiency are in place.

But how does one go about establishing quality assurance, knowing that management is likely to perceive the procedure as just another layer of overhead that will increase costs, extend delivery times and, in their view, have little, if any, positive impact on the bottom line?

We who have gray hairs (and others of us with no hair) have heard this management cry before and have quickly realized that the best strategy to use when addressing management is a marketing strategy.

Most marketing approaches center around a few key issues: objectives, impediments stemming from decision makers' apprehensions about the product or service or certain characteristics of it, decision makers' motives, corporate culture and "going for it" — making the presentation.

Make sure you have a clear and concise understanding of what you believe the quality assurance objectives are.

See **SELLING** page 96

Ragozzino is senior manager in the Cleveland office of Peat, Marwick, Mitchell & Co. and chairman of a task force to establish a National Quality Assurance Association. Pallenik is a systems development manager, and a former quality assurance manager, at American Greetings Corp. She is also a member of the task force.

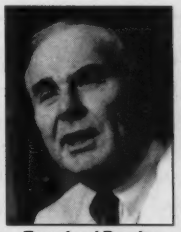
DPMA recognizes Brophy

Award winner stresses need for communication

By David A. Ludlum

HARTFORD, Conn. — Information systems were not the first thing that came to mind when Joseph T. Brophy, this year's winner of the Data Processing Management Association's (DPMA) top award, was asked to talk about himself. Brophy talked about bagpipes.

"I just put on a Celtic concert in West Hartford, with bagpipers and harpers. It was a big success," says Brophy, senior vice-president and data processing chief at The Travelers Corp.



Travelers' Brophy

Brophy, winner of the DPMA's Distinguished Information Sciences Award, is a bagpiper and former president of Hartford's St. Patrick's Pipe Band. When he is not planning information systems, he can be found using computers to study bagpipe harmonics.

But that experimentation did not win him the DPMA award, whose previous winners include retired Adm. Grace Hopper of the U.S. Navy, H. Ross Perot of Electronic Data Systems Corp. and David Packard of Hewlett-Packard Co.

In announcing the award, the DPMA referred to Brophy as an innovator whose achievements range from designing mathematic research applications in 1957 to launching an integrated voice/data network for 30,000 Travelers employees.

With Brophy's guidance, Travelers also has implemented one of the insurance industry's first customer information files, which allows the merging of data on individual customers that had resided in various product-line data bases.

Brophy grew up in what he refers to as

See **BROPHY** page 97

CEOs say information systems toughest to manage, most likely to face cost increase

By David A. Ludlum

Chief executive officers and other top managers consider information systems the most difficult corporate staff function to manage, according to a survey of leaders of 71 large companies that was released last week.

Information systems easily outdistance other functions rated by difficulty of management in the survey "Positioning Corporate Staffs for the 1990s," conducted by the American Productivity Center and the consulting firm Cresap, McCormick & Paget of New York.

The survey underlines the trend toward leaner, more responsive corporate staffs as global competition, deregulation and new technology put mounting pressures on businesses.

A trend clearly emerging is an effort by business leaders to make staff functions more responsive to line operations, to the units carrying out companies' production or to other principal operations. "It's a change in staff position from trying to control the line to trying to assist them," says Paul Hlavac, a principal with Cresap, McCormick and Paget.

To some top executives, one such effort would be "filtering all this data and making it something that's useful to line management," Hlavac says.

Another step would be to make sure the information systems manager has a broad knowledge of the business, which would allow better communication with line managers, he explains. Hlavac adds that top executives also would like to see line managers, and themselves, understand information systems better.

Of the companies surveyed, some say

See **INFO** page 95

INSIDE

AMR appoints Airline Automation president/**95**

Calendar: Selected conferences, exhibitions, seminars/**100**

INSTANT ANALYSIS

"The chief information officer must divorce himself of hard logic and coding — things of the MIS world — and concentrate on things pertaining to the general management world."

— Grady Baker, executive vice-president, Georgia Power Co.

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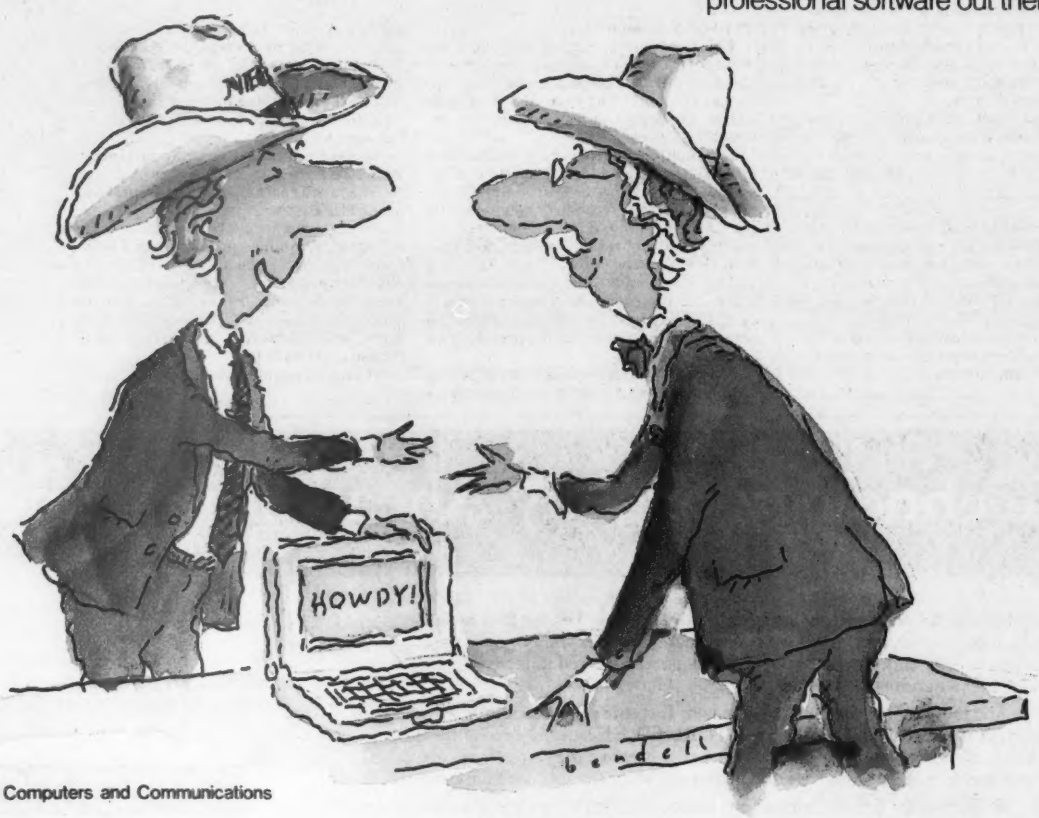

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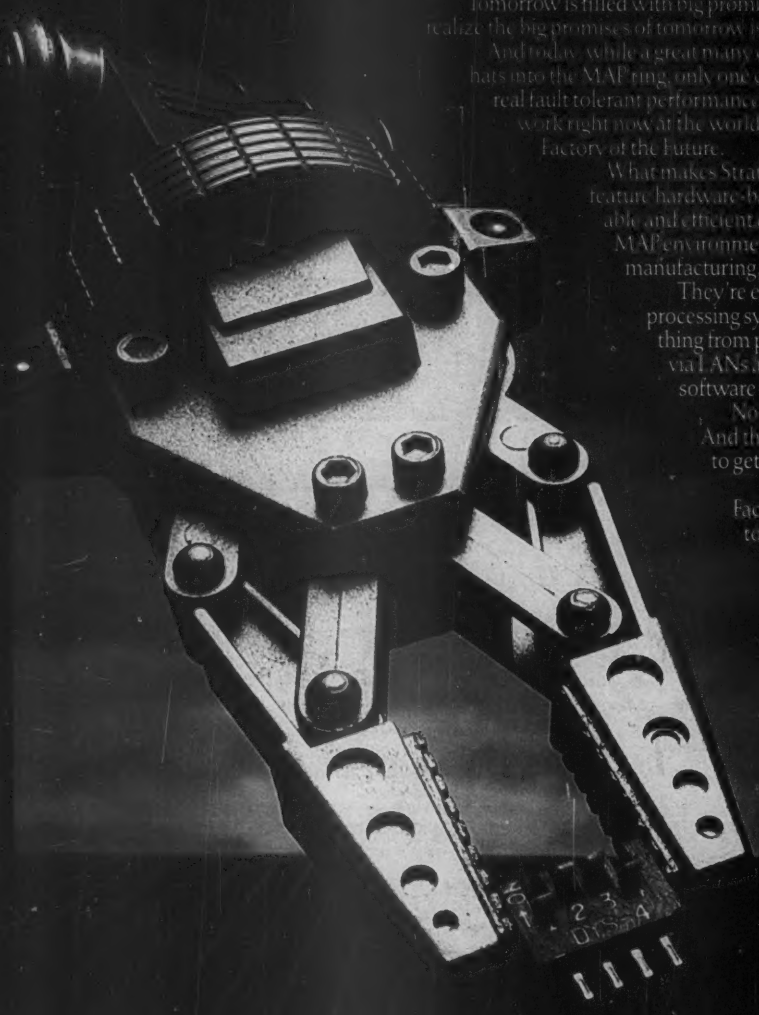

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AMR Airline Automation names Grossman president

Airline veteran takes control of DP sales

DALLAS — Arnold J. Grossman, a marketing and information systems veteran of four airlines, has been named president of AMR Airline Automation Services, part of the data processing service bureau recently spun off by American Airlines' parent company.

Grossman, 50, will oversee efforts of AMR Corp., American's parent, to sell to other airlines a broad array of data processing services of the sort that American has developed for itself.

These services include reservations, airport passenger processing, accounting, flight planning and operations, inventory control, cargo tracking and weather analysis.

AMR's Grossman

AMR Airline Automation, a division of AMR Information Services Corp., includes a reservations system similar to, but less powerful than, American Airlines' renowned Sabre system, which remains within American.

The system is cited as a classic example of the use of information technology to gain market share.

"This is an exciting opportunity," Grossman said in a written statement. He declined to be interviewed.

A key project in his new position will be implementing multihost agreements for reservations and passenger processing with Pan American World Airways, Transtar and Southwest Airlines, he said.

Grossman comes to AMR from serving as vice-president for marketing systems at Republic Airlines of Minneapolis, where he was responsible for automated marketing, travel agency services, reservations, yield management, distribution systems and planning sales.

Grossman was previously a vice-president of CCS Automation Systems, Inc., a subsidiary of Texas Air, and senior director of automated marketing for Continental Airlines.

Prior to that, Grossman spent 23 years at Pan American in marketing, planning, operations and government affairs.

In addition to AMR Airline Automation, AMR Information Services has three other divisions. They are AMR Cable Services, which serves cable television operators; Caribbean Data Services, which does data entry; and AMR Automation Training.

Info systems tough to manage

From page 91

they are even moving some traditional staff functions, including information systems, into the hands of line managers, although the greater possibility of duplication is recognized.

Executives expect that trend to gather steam, along with movements toward smaller corporate staffs, more flexible organization and more use of formal methods to evaluate staffs and allocate resources.

In the survey, information systems is cited as the most difficult function to manage by 23% of the respondents. Next is human resources, cited by 16%, followed by finance with 14% and legal activities with 13%.

As one unidentified chief executive puts it: "Top executives have been stung by MIS when development programs stumbled. Now they keep a close eye on MIS, which is the staff function most likely to get out of hand."

Some executives "clearly say they would involve themselves more in information systems policy and oversight," Hlavac says. They might establish the policy through a committee of the board of directors or one headed by the chief executive.

The top managers also overwhelmingly cite information systems as the function most likely to increase in cost, with 34% choosing it. Second is the legal department, which 16% name. Twenty-three percent say that no functions would increase in cost.

Those who expect information systems costs to increase the fastest attribute the outlook to increased use of information technology in marketing, investments, telecommunications and litigation, as well as to further automation of support services and replacement of systems.

Information systems ties for third place when executives pick the most important staff functions. Finance is named most critical by 44% of all respondents, human resources by 11% and information systems and planning by 9%.

Information systems, however, is named as the largest of the staff functions, accounting, on the average, for 23% of the total corporate staff. Finance is the next-largest staff function with 20%.

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Joseph & Cogan Associates, Inc.'s Network Interface I and Network Interface II provide your company with Burroughs to IBM network interface solutions that meet today's user communications requirements. Both interface systems are easily installed mainframe to mainframe data communications links.

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Selling quality assurance

From page 91

The key is not to have a 25-item list but a more effective list of three to five objectives that are clear and easy to understand.

A presentation must address the fears or uncertainties that management has regarding quality assurance. Before developing your marketing strategy, use your in-house network to gain an understanding of these apprehensions.

Some common uncertainties are a difficulty in determining benefits, fear of personnel being graded unfairly, lack of established quality standards, credibility of quality assurance personnel and "the Big Brother syndrome" — the fear that someone is always watching.

One aspect that management is most apprehensive about is staffing. What will the quality assurance manager look like? Will he require a corner office and a staff of thousands? Will he have degrees upon degrees and unlimited access to the president?

It is very important to eliminate such fears. Early in your marketing strategy, you should identify the organization and reporting structure of the quality assurance program, the functions it will perform and the characteristics of individuals involved, such as job descriptions, salaries, education, experience and career paths.

When presenting your proposal to the decision maker, you must know what will turn on this individual. Depending on his background and personality, there will be several ways to motivate him. You should structure your strategy to match them.

Some common incentives include security, belonging, recognition, comfort, achievement, power, affection, creativity, adventure, health and money. All of these may motivate an individual, but only a few will significantly influence him. Therefore, the key is to identify the one or two that really influence his thinking.

If an individual is motivated by security, market quality assurance as the key to keeping his job. If power is the key, market it as a function that will eventually require a very large staff and will have a strong influence on the organization. There is no need to stretch the truth, but there is a need to emphasize aspects to match motivating factors.

If you do not have an understanding of the individual's motivating factors, don't hesitate to ask those who may know, including secretaries. Try the puffer approach: "I have a meeting with your boss, and I am real nervous. What should I do?"

Every organization develops its own culture. One key to success in marketing is to understand that culture and work within it.

There are three chief factors here. First, understand how your organization likes to be sold — through a formal presentation to a committee, perhaps with outside consultants, or through an informal meeting with the information systems manager.

Second, prepare your presentation. Regardless of the organization's culture, don't let the presentation be a low priority. Don't take shortcuts or try to wing it because you are unprepared. Do your homework; you may not get another chance.

Third, determine who best can deliver the presentation to management. The MIS director? External consultants? Internal consultants? Someone who might become the director of quality assurance?

In most business environments, there comes a time when management will require a presentation. You generally have only one opportunity to get your point across, so you must strike while the iron is hot.

We all have different approaches to making presentations. The following methodology has proven over time to be successful. You should consider using it as a guide for developing your presentation:

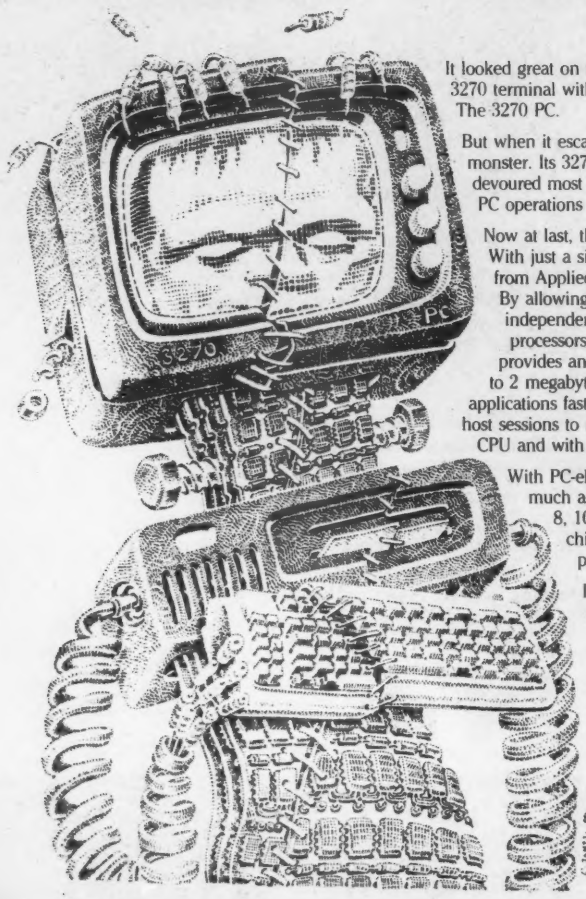
- Follow a five-step process. One, define the problem (for example, quality service levels are not being maintained). Two, note that competitors have quality assurance. Three, point to savings these competitors have achieved. Four, show how quality assurance can affect your firm's bottom line. And, five, have someone else — your boss, a consultant, the MIS director — confirm the key points.
- Focus only on the greatest concerns, such as program maintenance costs, reruns and the like. Use a few well-placed rifle shots with heavy impact; avoid buckshot sprayed all over the place.
- If possible, show tangible evidence of benefits, perhaps through charts, graphs or articles.
- Pause after completing each step and solicit questions, if appropriate.
- Get the decision makers to agree by asking for their input.
- Be enthusiastic, but be yourself.

Regardless of how successful you believe the presentation was, be prepared for management to reject your proposal. The most important thing to do then is to quickly develop a follow-up strategy and start planting the seed for the next presentation. Consider why the presentation wasn't successful, identify areas to be improved, develop a new strategy and establish your next steps.

Whatever you do, do not fall victim to the belief that management was not ready to accept your proposal regardless of how good it was — that is not true.

If your proposal was not accepted, there is only one person at fault — you. If you can accept that, your next presentation will have a much greater chance of success.

The 3270 PC. Dr. Frankenstein's Latest Monster.



It looked great on the drawing board. Combine a 3270 terminal with a PC in a single box. Like magic. The 3270 PC.

But when it escaped from the lab, it turned into a monster. Its 3270 Master Control Program devoured most of the available RAM. And it slowed PC operations to a tortured crawl.

Now at last, the dreaded monster can be tamed. With just a single plug-in board, PC-elevATor, from Applied Reasoning Corporation. How? By allowing 3270 and PC sessions to run independently of each other with separate processors and memory. PC-elevATor provides an 80286 processor and up to 2 megabytes of on board RAM to run DOS applications faster than an AT. This leaves 3270 host sessions to run alone on the 3270 PC's 8088 CPU and with all its RAM (up to 640K).

With PC-elevATor, DOS applications can run as much as ten times faster. It is available with 8, 10 or 12.5 Mhz versions of the 80286 chip. And an optional 80287 floating point co-processor.

If you have a monster on your desk, call us for help. Find out how the PC-elevATor can lift your 3270 PC out of the Dark Ages.

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MANAGEMENT

Brophy stresses communications

From page 91

the "ghetto-type" Irish New York City neighborhood that surrounded Columbia University, a competitive environment full of "very smart kids" that encouraged energy, drive and ambition.

He joined the U.S. Marine Corps when he was 15 but was discharged for being under age. He attended Fordham University, majoring in math and graduating in two years while spending nights on call at a hospital as an ambulance driver. There he met his wife, an emergency room nurse.

Brophy worked in operations research, where he first encountered tabulating machines. He moved on to actuarial work, calculating the risks and expenses of issuing insurance, at Prudential Life Insurance Co. of Newark, N.J., and "really got exposed to computers," he says.

In 10 years at Prudential, Brophy put together a corporate MIS department, hampered, he says now, by a lack of management skills and a facility for corporate politics.

Brophy then took a job as vice-president and chief actuary at Bankers National Life Insurance Co. of Morristown, N.J., where he soon took over data processing.

Brophy says understanding the insurance business from the actuary's point of view, in addition to knowing data processing, has given him an edge in his career. "I think that is one of the reasons why I succeeded," he says.

Commenting on the DPMA award, Travelers Chairman and Chief Executive Edward H. Budd says that Brophy "is able to grasp the essential business issues and develop sound action plans to forge a synergistic coalition among our business and technical people."

Mission to control DP operations

Leaving Bankers National in the wake of a takeover, Brophy joined Travelers with a mission to develop standards and management controls for its enormous and innovative data processing operation. He was put in charge of DP in 1977. Last year, Travelers' revenue reached $14.6 billion.

Integrating information processing is key to financial services, including insurance, Brophy says. The value of conventional office automation lies in the opportunity to replace clerical employees with more productive "knowledge workers," those who process information. Travelers' focus is on office communications to link those workers, particularly by integrating voice and data.

"Our biggest accomplishment here is that we have an extremely high degree of automation of transaction processing systems, and it's integrated in a true way — an integrated network," he says.

Full integration next step

Travelers has two data centers joined by T1 carriers, about 25 local-area networks in Hartford linked to a wide-area network, 85% of which is wired with cable. Independent agents are also tied into the corporate network, which is run on IBM mainframes under IBM's Systems Network Architecture. Fully integrating voice and data is the next step, Brophy says.

Brophy has found a business perspective particularly useful as Travelers moved from a product orientation to a focus on customer service. One adaptation to the change was the development of the customer information file. Now, with exceptions for security purposes, the Travelers' 35,000 terminals and personal computers can access any of its 3,600 data bases, Brophy says.

"We're building the enterprise communication environment to facilitate the knowledge workers," Brophy says. "We're moving into a world that has tremendous potential for making better decisions.

"You have to take a corporate vision — you have to have an enterprise vision — to do it."

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The AT&T 6500 will tie together data and applications from up to three synchronous and 16 asynchronous hosts. Not to mention allowing PCs to work as terminals.

What's more, you can switch between synchronous and asynchronous hosts with a single keystroke.

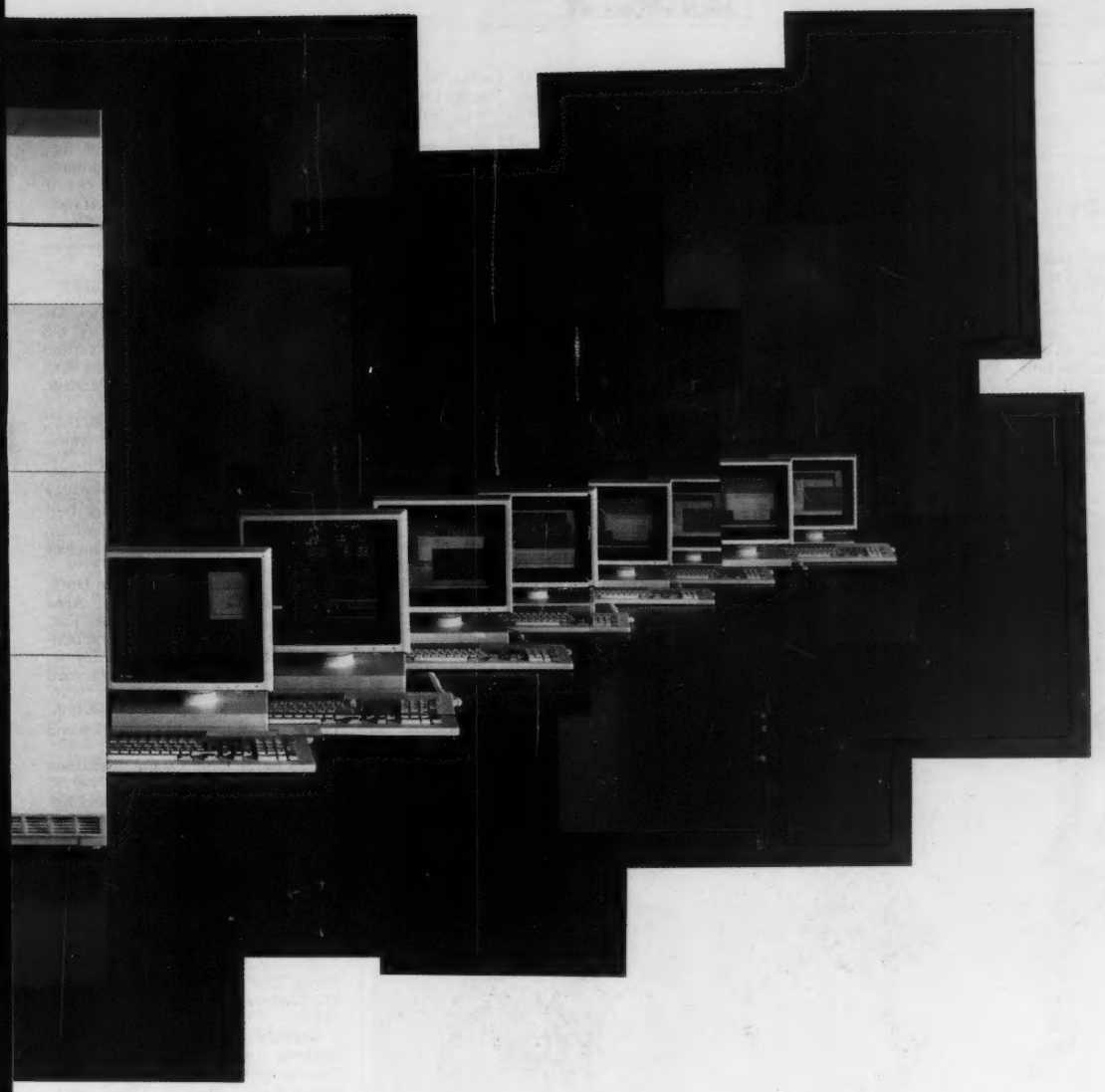
FOUR WINDOWS.

The 6500 lets you create up to four windows at the same time—into both synchronous and asynchronous hosts—and freely pass information among databases.

For example, an inside salesperson taking an order could access: the customer's credit status in one host; relevant inventory information from another host at a completely different location; and the order form to fulfill the request from yet a third host.

All on a single screen.

That kind of power means big productivity gains with no outlay for costly systems and applications development.



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CALENDAR

SEPT. 28-OCT. 4

1986 Society for Information Management Annual Conference. Dallas, Sept. 28 to Oct. 2 — Contact: Priscilla Lorenzin, Conference Manager, 1986 SIM Annual Conference, P.O. Box 7030, Chicago, Ill. 60680.

National Communications Forum. Chicago, Sept. 29 to Oct. 1 — Contact: NCF, 505 N. Lake Shore Drive, Chicago, Ill. 60611.

Financial Information Systems — The New Generation. Los Angeles, Sept. 29 to Oct. 1 — Contact: NIMR Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

Expo III (Pick Users Show). Reno, Nev., Sept. 29 to Oct. 1 — Contact: Expo-TMS, 22951 La Candena, Laguna Hills, Calif. 92653.

Performance/Capacity Management Tutorial Week. Monterey, Calif., Sept. 29 to Oct. 2 — Contact: The Institute for Information Management, Suite 230, 1901 S. Bascom Ave., Campbell, Calif. 95008.

Institute on Artificial Intelligence and Expert Systems. Chicago, Sept. 29 to Oct. 3 — Contact: Joan Merrick, Seminar Coordination Office, Suite 415, 850 Boylston St., Chestnut Hill, Mass. 02167.

Compuserve National Banking Symposium. Columbus, Ohio, Sept. 30 to Oct. 1 — Contact: Compuserve, 5000 Arlington Centre Blvd., Columbus, Ohio 43220.

Products '86. Dallas, Sept. 30 to Oct. 1 — Contact: Future Computing, Inc., 8111 LBJ Freeway, Dallas, Texas 75251.

Financial Networks Workshop. Chicago, Oct. 1-2 — Contact: American Bankers Association, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

Fifth Annual Corporate Electronic Payments Conference. New York, Oct. 1-2 — Contact: George C. White, White Papers, Inc., 95 Gordonhurst Ave., Upper Montclair, N.J. 07043.

CD-Interact '86. Chicago, Oct. 1-4 — Contact: Microtrends, Inc., Suite 730, 650 Woodfield Drive, Schaumburg, Ill. 60173.

First National Desktop Publishing Trade Show. Chicago, Oct. 2-3 — Contact: Personal Publishing Show, P.O. Box 390, Itasca, Ill. 60143.

Integrating CAD/CAM/CAE/CIM Into Your Organization: Issues, Pitfalls, Payback. Boston, Oct. 2-3 — Contact: Joella Nelke, Technology and Business Communications, Inc., 730 Boston Post Road, Sudbury, Mass. 01776. Also being held Oct. 9-10 in St. Louis, Oct. 16-17 in Orlando, Fla., and Oct. 30-31 in Los Angeles.

OCTOBER 5-11

Network Users Association's Annual Fall Meeting. Denver, Oct. 6-8 — Contact: Teresa Robinson, National Trade Productions, Inc., Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22314.

VSAT Expo '86. Washington, D.C., Oct. 6-8 — Contact: Telestrategies, 1355 Beverly Road, McLean, Va. 22101.

Information Management Exposition & Conference. New York, Oct. 6-9 — Contact: Cahners Exposition Group, P.O. Box 3833, 999 Summer St., Stamford, Conn. 06905.

Tenth International Fiber Optic Communications and Local Area Networks Exhibition. Orlando, Fla., Oct. 6-10 — Contact: Cheryl MacDonald, Exhibit Coordinator, Information Gatekeepers, Inc., 214 Harvard Ave., Boston, Mass. 02134.

PC Expo. Chicago, Oct. 7-9 — Contact: 333 Sylvan Ave., Englewood Cliffs, N.J. 07632.

Computer and Communications Security '86. New York, Oct. 7-9 — Contact: Robin Schmidt, Cahners Exposition Group, Box 5060, Des Plaines, Ill. 60017.

Dexpo West 86 Show. San Francisco, Oct. 7-10 — Contact: Expoconsul International, Inc., 3 Independence Way, Princeton, N.J. 08540.

National Conference on Factory Automation. Southfield, Mich., Oct. 7-10 — Contact: Will Case, Software Career Link, 15 Olde Boston Square, 270 Littleton Road, Westford, Mass. 01886.

Seyt old Group's Conference on Desktop Communications. San Francisco, Oct. 9-11 — Contact: Seybold Group, Suite 132, 20695 Western Ave., Torrance, Calif. 90501.

OCTOBER 12-18

Computer-Aided Manufacturing-International's 15th Annual Meeting and Technical Conference. San Antonio, Texas, Oct. 14-15 — Contact: CAM-I, Inc., Suite 1107, 611 Ryan Plaza Drive, Arlington, Texas 76011.

National and Federal Office Automation Conferences. Washington, D.C., Oct. 14-17 — Contact: NOAC, P.O. Box N, Wayland, Mass. 01778.

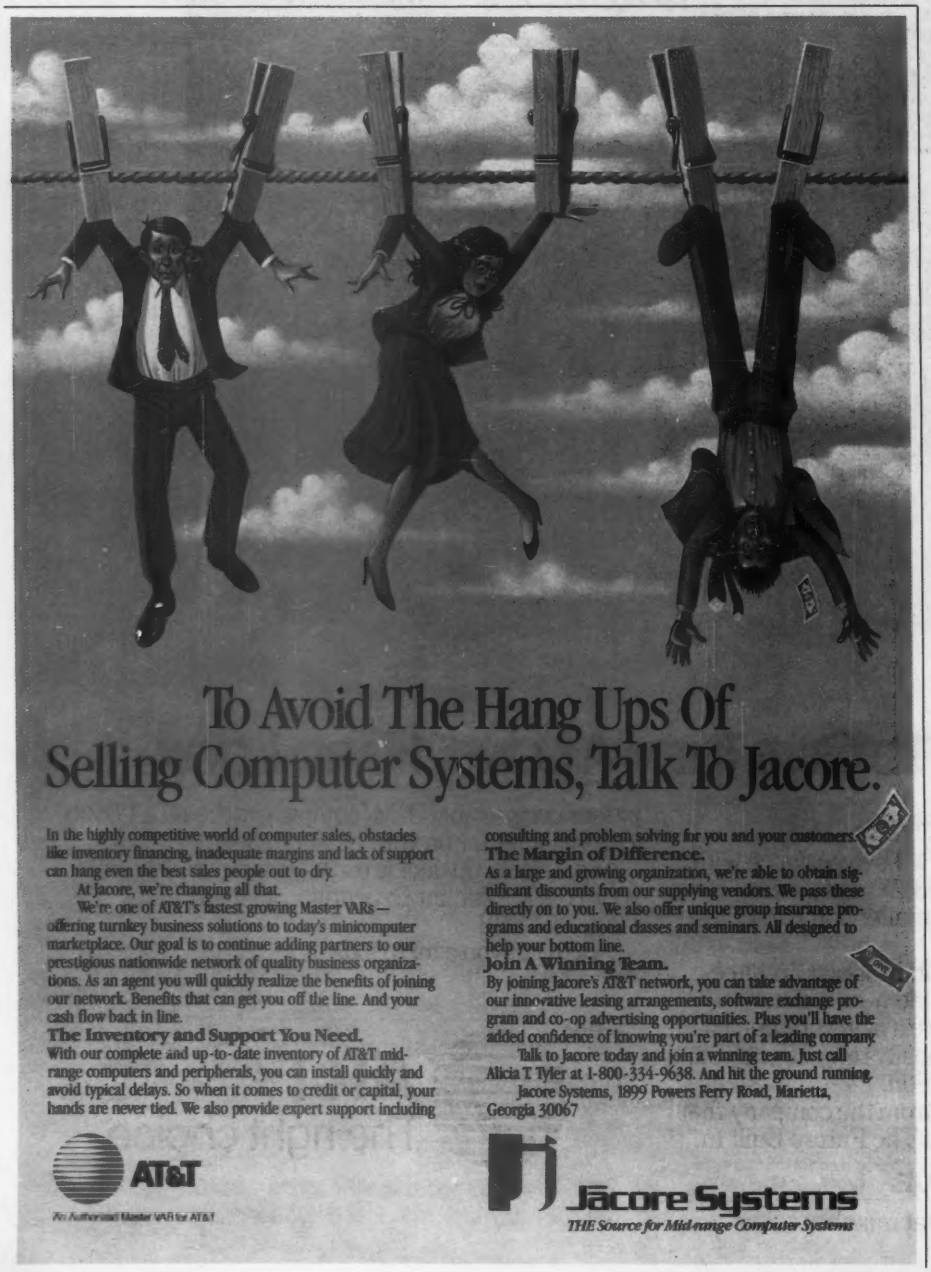
Optical Publishing '86. Oct. 15-17, New York — Contact: Learned Information, Inc., 143 Old Marlton Pike, Medford, N.J. 08055.

Scan-Tech 86. San Francisco, Oct. 15-17 — Contact: Automatic Identification Manufacturers, Inc., 1326 Freeport Road, Pittsburgh, Pa. 15238.

OCTOBER 19-25

Central Prime Users Group Ninth Annual Meeting. Chicago, Oct. 19-21 — Contact: Deborah Morby, Computronics, 4N165 Wood Dale Road, Addison, Ill. 60101.

Technetron '86. Boston, Oct. 19-22



— Contact: Wang Laboratories, Inc., Mail Stop 1935, One Industrial Ave., Lowell, Mass. 01851.

Third-Party and Self Maintenance Conference. New York, Oct. 20-21 — Contact: Frost & Sullivan, Inc., Department RE-828 E, 106 Fulton St., New York, N.Y. 10038.

Unixexpo. New York, Oct. 20-22 — Contact: National Expositions Co., Suite 12A, 49 W. 38th St., New York, N.Y. 10018.

Index '86. Boston, Oct. 20-22 — Contact: Bunny Wing-Fernhall, Executive Director, Wang Users Society of America, P.O. Box 174, De Kalb, Ill. 60115.

Infomatics '86. Toronto, Oct. 20-23 — Contact: International Information Management Congress, P.O. Box 34404, Bethesda, Md. 20817.

American Production and Inventory Control Society 29th Annual International Conference and Technical Exhibit. St. Louis, Oct. 20-24 — Contact: APICS, 500 W. Annandale Road, Falls Church, Va. 22046.

Electronic Linkage of International Markets. New York, Oct. 21 — Contact: Waters Information Services, Inc., P.O. Box 2248, Binghamton, N.Y. 13902.

International Symposium on Methodolgies for Intelligent Systems. Knoxville, Tenn., Oct. 21-25 — Contact: UTK Department of Conferences, 2014 Lake Avenue, Knoxville, Tenn. 37996.

Software Configuration Management and Software Quality Assurance. Santa Maria, Calif., Oct. 22-24 — Contact: Software Certification Institute, P.O. Box 2328, Santa Maria, Calif. 93455.

Tenth Annual Data Entry Management Association Conference and Equipment Exposition. Las Vegas, Oct. 22-24 — Contact: DEMA, 750 Summer St., Stamford, Conn. 06901.

Seventh Annual Computer Law Institute. New York, Oct. 23-24 — Contact: Mary Kilroy, Law & Business, 855 Valley Road, Clifton, N.J. 07013.

OCT. 26-NOV. 1

Digital Document Automation: The Emerging User. Reston, Va., Oct. 26-28 — Contact: Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

International Data Corp.'s MIS Executive Conference. Palm Springs, Calif., Oct. 26-29 — Contact: IDC, 5 Speen St., Framingham, Mass. 01701.

Fifth World Congress on Medical Informatics. Washington, D.C., Oct. 26-30 — Contact: George Washington University Medical Center, Office of Continuing Medical Education, 2300 K St. N.W., Washington, D.C. 20037.

Annual Teleconferencing Users Conference. Anaheim, Calif., Oct. 27-29 — Contact: Applied Business Telecommunications, Box 5106, San Ramon, Calif. 94583.

Data Processing Management Association Annual Computer Conference and Business Exposition. Atlanta, Oct. 27-29 — Contact: DPMA International, 505 Busse Highway, Park Ridge, Ill. 60068.

Hammer Forum 86. Cambridge, Mass., Oct. 27-29 — Contact: Hammer and Co., Five Cambridge Center, Cambridge, Mass. 02142.

Distribution Computer Expo '86 East. Parsippany, N.J., Oct. 29-30 — Contact: C.S. Report, Inc., P.O. Box 453, Exton, Pa. 19341.

Association of Public Data Users 11th Annual Conference. Washington, D.C., Oct. 29-31 — Contact: Susan Anderson, APDU, 87 Prospect Ave., Princeton, N.J. 08544.

Computer Dealers and Lessors Association Annual Meeting. Colorado Springs, Oct. 30 to Nov. 1 — Contact: CDLA, 1212 Potomac St. N.W., Washington, D.C. 20007.

NOVEMBER 2-8

ADAPSO 65th Management Conference. Phoenix, Nov. 2-5 — Contact: ADAPSO Education Dept., Suite 300, 1300 N. 17th St., Arlington, Va. 22209.

Fall Joint Computer Conference '86. Dallas, Nov. 2-6 — Contact: Stanley Winkler, FJCC '86, 1730 Massachusetts Ave. N.W., Washington, D.C. 20036.

Automated Manufacturing Exhibition and Conference. Greenville, S.C., Nov. 3-6 — Contact: Allen F. Barney, AM86, P.O. Box 5616, Greenville, S.C. 29606.

Electronic Imaging '86. Boston, Nov. 3-6 — Contact: MG Expositions Group, 1050 Commonwealth Ave., Boston, Mass. 02215.

Long Range Information Systems Planning. Washington, D.C., Nov. 3-6 — Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

Advancing Standards Technology for Distributed Information and Telecommunications Systems. Boston, Nov. 3-7 — Contact: Omnicom, Inc., Suite 304, 501 Church St. N.E., Vienna, Va. 22180. Also being held Dec. 15-19 in Denver.

North American Telecommunications Association Convention & Exhibition Showcase. St. Louis, Nov. 5-7 — Contact: NATA, Suite 550, 2000 M St. N.W., Washington, D.C. 20036.

Scientific Computing & Automation Conference and Exposition. Atlantic City, Nov. 5-7 — Contact: Anthony Scalisi, Expocon Management Associates, Inc., 3695 Post Road, Southport, Conn. 06490.

Second Annual Conference on Optical Storage for Small Systems. Los Angeles, Nov. 5-7 — Contact: Technology Opportunity Conference, 256 Laguna Honda Blvd., San Francisco, Calif. 94116.

Second Annual Software Management Stategies Conference. Toronto, Nov. 6-7 — Contact: Gartner Group, Inc., 72 Cummings Point Road, Stamford, Conn. 06902.

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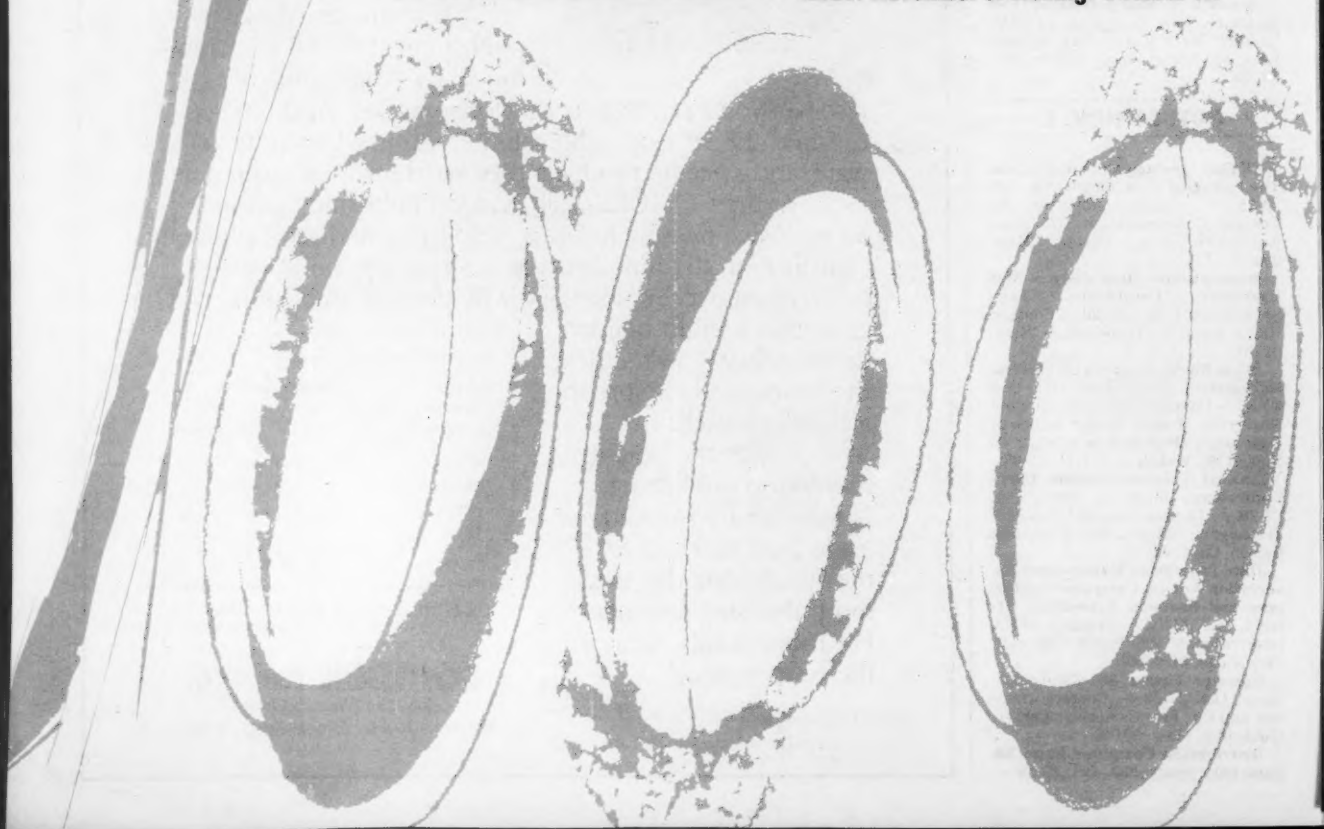
But hurry, because the present never seems to last.

The closing date for this November 3 issue—for advertisers who want to take advantage of the special offer of $1 per line—is October 10. Advertisers not wanting to participate in this offer may observe the closing date of October 17 for color, premium positions, inserts, etc. and October 24 for b/w space for the regular editorial section. To reserve your space—and special matching space—call Ed Marecki, Vice President/Sales, Computerworld at 617-879-0700 or your Computerworld representative today.

COMPUTERWORLD

Issue: November 3. Closing: October 10.



NEW PRODUCTS

AT&T unveils PC imaging graphics tool

AT&T's Electronic Photography and Imaging Center has unveiled a graphics board said to allow personal computers to capture and display television-quality images in color or black and white.

Targa M8 has a 518- by 482-pixel resolution and real-time frame capture from video sources. The M8 reportedly can display a total of 256 colors simultaneously from a palette of more than 16 million colors. For black and white images, the board can display 256 shades of gray.

Designed for the AT&T Personal Computer 6300 and 6300 Plus, the Targa M8 has a color-mapping capability that can minimize file size for the microcomputer, enhance color resolution and provide the ability to cycle through colors to produce animation effects, the vendor said.

Another feature of the graphics board is its ability to combine high-resolution color graphics with standard IBM Color Graphics Adapter (CGA) output on the same screen. One operating mode, called loop-through, permits the display of either CGA or M8 graphics on the full screen. A second mode, called mix-through, permits display of both graphics outputs at the same time.

Targa M8 can also be used with the IBM Personal Computer, PC XT, AT and compatibles. It costs $1,995.

AT&T also announced additions to its Truevision family of microcomputer graphics hardware and software. One addition, a version of Truevision PC Carousel presentation software for the Targa 16 graphics board, allows users to put Truevision images into an electronic slide show. The software costs $150.

Truevision Type Fonts, an assortment of 30 font styles and sizes supplementing the selection of fonts in Truevision Image Processing Software, was also released. It is priced at $100.

The Truevision Composite Video Adapter, a half-length personal computer board that converts composite video signals to analog red-green-blue and analog signals to composite video, also debuted. The board costs $495.

CMS enters printer market

CMS, Inc. of Costa Mesa, Calif., has entered the personal computer printer market with its 8 page/min laser printer.

Laserpower is currently available for $2,795.

The printer features a resolution of 300 by 300 dot/in. for high-quality text or graphics and offers a selection of plug-in parallel, serial or IEEE 488 interfaces for compatibility with most personal computers, a CMS spokesman said.

The printer's memory capacity is 256K bytes, which is said to be expandable to 1.5M bytes to support full-page, 300 dot/in. resolution for graphics-intensive applications.

Laserpower offers a 300 dot/in. resolution.

Available type fonts

Laserpower features six resident type fonts that are said to emulate most popular printers, such as the Diablo Systems, Inc. 630, Epson America, Inc. FX-80 and IBM Proprinter.

Additional type fonts that the printer emulates are the Courier 10 font, including landscape, bold and italic, and 12 international character sets.

Laserpower has paper cassette trays that can accommodate 100 sheets of either legal- or letter-size paper at one time. It can also print labels and overhead transparencies when they are inserted manually. The printer is rated at 55db, according to the vendor.

Three optional font cards are available for the Laserpower. These cards provide Prestige Elite 12, including bold, proportional spaced, Letter Gothic 12 and Pica 10 type; the IBM graphics printer character set; and the Diablo ECS character set, including scientific and teletext.

Optional paper-handling features include a dual-bin sheet feeder, paper flipper and multibin sorter.

PC connector attaches remote micros, IBM minis via synchronous modem

CXI, Inc. of Palo Alto, Calif., recently introduced the PCOX/5250 Remote, which allows remote personal computers to connect to IBM System/34, 36 and 38 minicomputers via a synchronous modem.

The connection emulates the IBM 5251 Model 12 or 5294 Control Unit, enabling it to perform as IBM 5251, 5291 or 5292 display stations, providing concurrent access to up to nine host sessions, a CXI spokesman said.

The product also enables serial or parallel printers attached to a PC to act as host-addressable printers, such as IBM 5256 dot matrix, 5224 and 5225 printers. Because a host session can be used as a printer session, up to five printers can be driven simultaneously. No changes to the host or PC software are required, according to the vendor.

PCOX/5250 Remote is also available with PCOX/5250 File Transfer, which enables users to upload or download files between the PC and the host with translation to and from a number of commonly used PC data types, including ASCII.

The file transfer is also compatible with IBM System/34, 36 and 38 file transfers. In addition, the connection is compatible with software written to the IBM 5250 application program interface.

Available now, the product includes an interface board, modem cable and terminal emulator software. The PCOX/5250 Remote with file transfer sells for $745; without file transfer, the price is $645. Sold separately, the file transfer package costs $150.

CXI also offers a local 5250 emulation package called PCOX/5251 Twin X.

INSIDE

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The Common Sense Data Network

The solution to most real-world data communications needs is a hybrid network. One that complements the performance features of a LAN and the efficiency of a WAN.

It's simple common sense and it's called DevelNet.

In its most basic form, DevelNet is a data switch—but with a significant difference. DevelNet is the most sophisticated data switch available today.

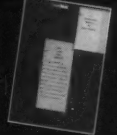
DevelNet features unlimited growth, tremendous data gathering capabilities, and gateways to complement your existing 802.3, X.25 and T.1 networks. DevelNet's performance is proven daily at NASA's Kennedy Space Center.

If you're in the market for a high-performance, cost-effective data network, you can't afford not to consider DevelNet.

Call or write to receive your DevelNet literature, "A Common Sense Approach to Data Networking."

6701 Sierra Court, Dublin, CA 94568, 800-423-9210.

DevelNet
The Common Sense Network



Develcon
The Northern Light in Data Communications

SOFTWARE & SERVICES

Systems software

Intel Corp. has announced **Release 7.0** of its **Irmx 86** real-time multitasking operating system.

The release includes interactive configuration utility screens for incorporating device drivers for Multibus I peripheral controller boards. Additional features are terminal support code, which enables a block-mode terminal to transmit an entire block of data with a single keystroke, inclusion of system call external declaration files for Pascal- and Fortran-based programs, an extended I/O system and a logon feature that allows users to log on to any available terminal on the system.

The operating system runs on any Intel 8086, 8088, 80186, 80188 or 80286 microprocessor.

The Irmx 86 operating system costs $6,000 for the initial license fee.

Intel, P.O. Box 58065, 3065 Bowers Ave., Santa Clara, Calif. 95052.

Applications packages

Telaccount, Inc. has introduced a comprehensive **call accounting** software package for 100- to 2,000-station telephone networks that require reports for traffic analysis, cost allocation and reseller billing.

The software is said to be capable of collecting private branch exchange data from multiple sites via remote polling. It provides cost allocation reports on station, department, division and company levels and also generates detailed and summary cost breakdowns by project code for billing purposes.

It operates on AT&T's 7300 and 3B1 processors.

The price for the 100-station network software begins at $1,995. Software for the 2,000-station system costs up to $15,000.

Telaccount, Suite 102, 4470 Redwood Road, San Rafael, Calif. 94903.

■

Systems Effectiveness Associates, Inc. has introduced **Ramcad**, computer-aided engineering software said to bridge the gap between the company's reliability and maintainability analysis software and popular computer-aided design (CAD) systems.

Ramcad reportedly accepts part numbers, quantities, reference designators and temperature data extracted from CAD systems and transfers this data to the firm's family of integrated predictive analysis programs. Report-ready printouts are generated.

Ramcad runs Digital Equipment Corp. VAX and Microvax II processors using the VMS or MicroVMS operating systems and is licensed at $2,000.

Systems Effectiveness Associates, 20 Vernon St., Norwood, Mass. 02062.

■

Wright & Associates, Inc. has introduced its **Customer/Supplier Communications** system, designed to meet automotive suppliers' requirements.

The Customer/Supplier Communications system, integrated with shipping and invoicing modules, is said to create an information network between automotive companies and their suppliers. The software allows the user to retrieve releases from General Motors Corp., Ford Motor Co. and Chrysler Corp. through the use of telecommunications.

Customer/Supplier Communications for the IBM System/36 is priced at $15,000, and for the System/38 at $28,000.

Wright & Associates, 44567 Pinetree Drive, Plymouth, Mich. 48170.

■

Lawson Associates, Inc. has announced **Release 4.0** of **Pinstripe Payroll**, the company's business applications software for use with IBM System/38 and Burroughs Corp. systems.

Features of Release 4.0 are said to include multiple automatic direct deposit to employee banking accounts, multiple history inquiry facilities to employee data, on-line generation of manual check data, garnishment deductions and payment-in-kind processing.

Pinstripe Payroll Release 4.0 for the System/38 costs $20,000; for Burroughs systems B2000 to B7000 and A Series, it costs $34,000; and for the B1000, it costs $17,000.

Lawson Associates, 2021 E. Hennepin Ave., Minneapolis, Minn. 55413.

■

Management Resource Partners has announced **Version 7.1** of **PACS/38 RPG-III** for closed-loop manufacturing resource planning.

The program is adaptable to both discreet and repetitive manufacturing, according to the vendor.

PACS/38 is said to incorporate backflush, or automatic inventory record adjustment by operation.

Other features of the program include options in on-line master scheduling, manufacturing resource planning and pegging of load source vs. capacity.

PACS reportedly uses a threshold-setting technique that allows users to tune system response time and to tailor system logic without programming.

A license for PACS manufacturing, cost accounting and order processing is $105,000.

Management Resource Partners, Suite 215, 209 W. Central St., Natick, Mass. 01760.

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No other mainframes have generated data like this.

Nobody knows how good a mainframe is better than the people who actually use it. And among those experts, the people who use Burroughs mainframes are the most satisfied.

That data doesn't come from us. It comes from Datapro Research Corporation—a leading independent research firm.

DATAPRO SURVEY	
Category	Company Ranked #1
Overall Customer Satisfaction	Burroughs
Ease of Operation	Burroughs
Operating System Software	Burroughs
Ease of Programming	Burroughs
Ease of Conversion	Burroughs

In Datapro's annual survey of mainframe users, no computer company ranked first in more categories than Burroughs—eight altogether, including the big one: overall customer satisfaction. And that's not even counting our seconds and thirds.

But Burroughs not only outperformed the competition, we outperformed ourselves. Improving our rating in 23 categories over last year.

Clearly this says something about the quality of our systems.

That's why of all the data our mainframes have generated, little has made us prouder.

Burroughs

EVEN IN OUR EARLIEST DAYS, OUR EMPLOYEES EXHIBITED LEADERSHIP.

Four score and seven years from now, will the company that sold you your business software be around to fix a problem?

Promises don't count. You have to look at a company's actual history.

At McCormack & Dodge, we're in the unique position of having two histories, both distinguished, to submit for your consideration.

One is our own, dating back to the 1960's, when we began as a one-package software house in the Boston area. Through leadership technology, we grew to be a global company, serving the world's greatest corporations with a broad multi-package software line.

The second history belongs to our parent, Dun & Bradstreet. It dates back to pre-Civil War days, when one Mr. Lincoln worked as a D&B credit correspondent.

No American company has a better history of stability than Dun & Bradstreet.

Put this proven stability together with the proven technology of McCormack & Dodge, and you have something unique in the software industry.

A supplier whose strength eases your mind when you worry about the years ahead. Even if it's four score and seven of them.

McCormack & Dodge

a company of
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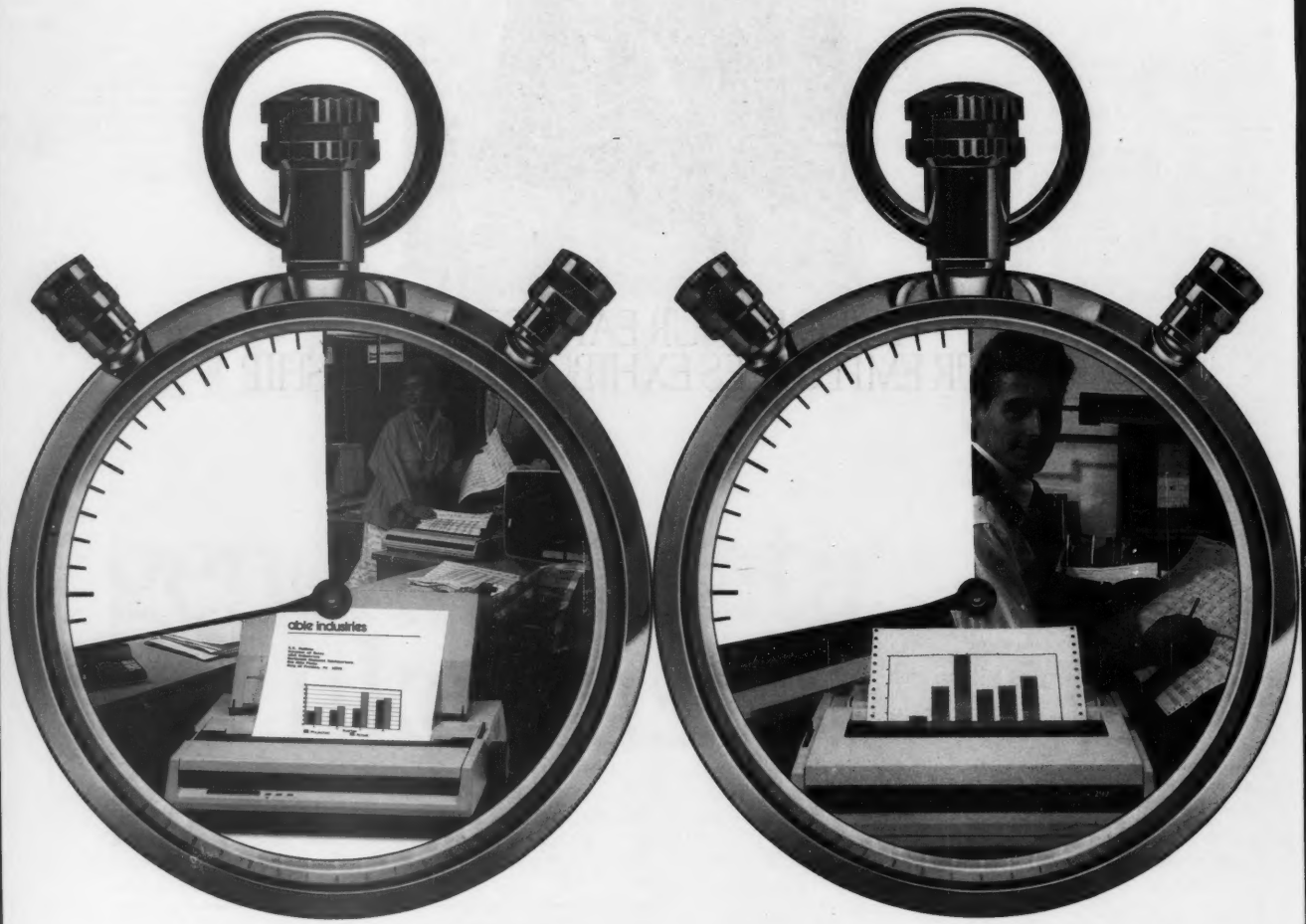
McCormack & Dodge Corporation, 1225 Worcester Road, Natick, MA 01760, 1-800-343-0325

EVERY DEPARTMENT RUNS



Introducing the New MICROLINE® 190 Plus and 290 Series.

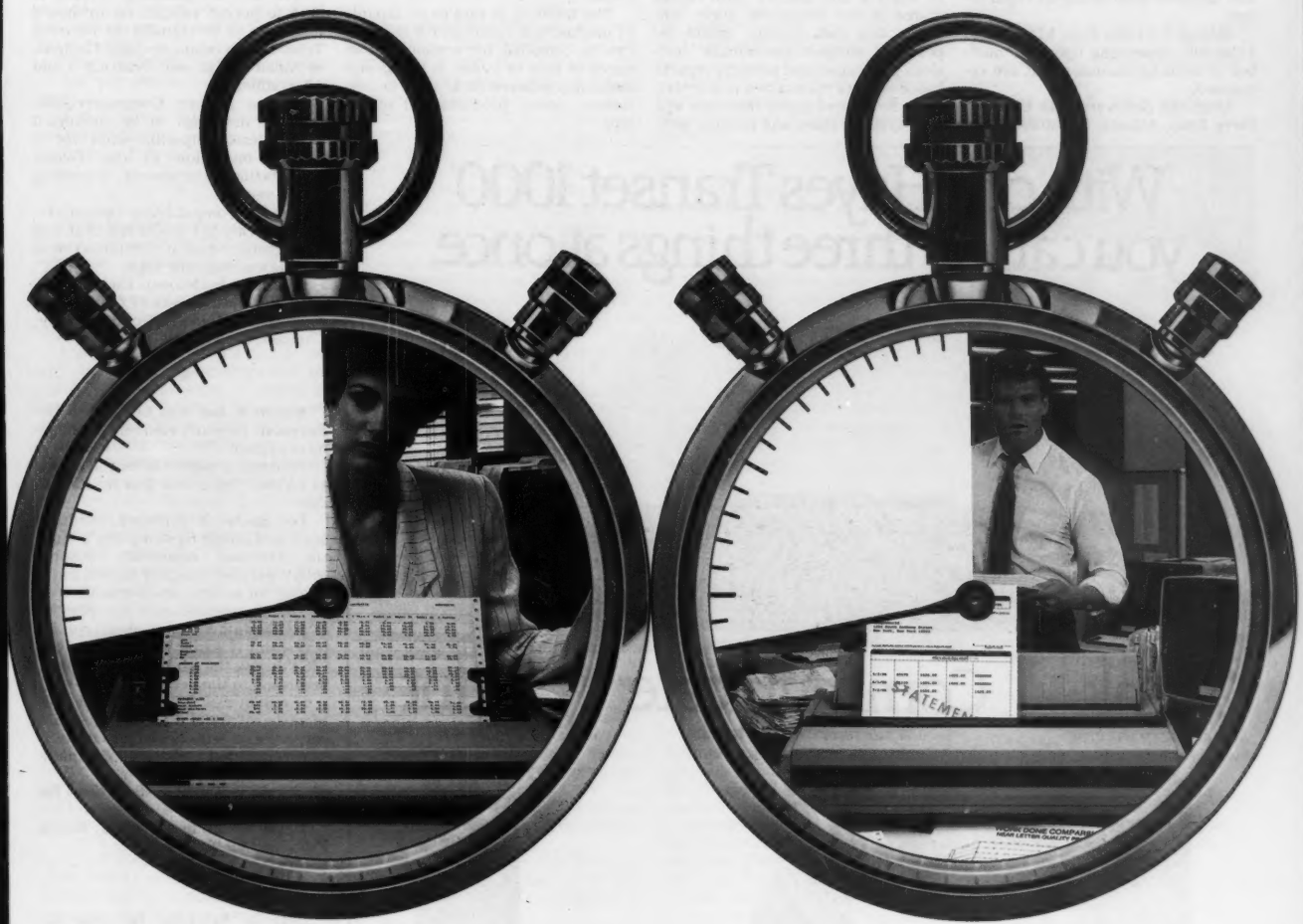
These new printers are so fast they work in OKIDATA Minutes. Shorter, faster, more efficient minutes. The same work that took 60 seconds to produce with other popular printers, now takes as little as 43 seconds.

With the MICROLINE 190 Plus Series they'll print urgent memos and reports at 200 cps. Important letters at 40 cps. More quietly than other printers. And for those requiring even higher performance, the new MICROLINE 290 family offers Utility speeds of up to 400 cps, Near Letter Quality at 100 cps — and does it all with graphics and text in 14 different colors.

Impressive? You bet! But we know you need a printer with more than that.

Better paper handling, for example. You can feed these new printers almost any type of paper made. From the bottom, top or rear.

FASTER ON OKIDATA TIME.



They'll like the speed. You'll like the reliability.

And, they're completely compatible with the IBM® PC.

But, best of all, the new 190's Plus and 290's are OKIDATA printers. With all the durability and reliability that OKIDATA's famous for.

Put your company on OKIDATA time. Start every department printing what once took 60 seconds, in an OKIDATA Minute.

To find out more about the new 190's Plus and 290's, call your OKIDATA dealer. Or call us at 1-800-OKIDATA.

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We put business on paper.

Registered Trademarks: OKIDATA and MICROLINE (registered U.S. trademark) Oki America, Inc. OKIDATA, Marque déposée, Oki America, Inc. IBM, International Business Machines Corp.

American Software, Inc. has announced **Release 6.2** of its on-line, real-time **Customer Order Processing System** for IBM mainframes. The system includes an electronic transfer interface module for companies that collect orders from point-of-sale devices.

Release 6.2 features a single-customer master file, which may be shared with accounts receivable, and a perpetual inventory system for purchased, manufactured or warehoused goods. The system may be used in a multilocation environment and includes drop shipment capabilities.

Release 6.2 costs from $119,000 to $150,000, depending upon the number of optional modules that are requested.

American Software, 443 E. Paces Ferry Road, Atlanta, Ga. 30305.

Languages

SPSS, Inc. has added **Capture,** a structured query language and data system interface to the company's **SPSS-X** data analysis and fourth-generation language development system.

Capture reportedly allows users to access the structured query language to read data directly into SPSS-X. Once read into SPSS-X, the data may be analyzed by all of that system's statistical and reporting tools.

The interface is said to allow users to analyze and display information stored in the structured query language and data system; create reports to support last-minute decisions and automated periodic reports based on data maintained and updated in structured query language and data system tables; and produce publication-quality tables of unlimited format and content using the SPSS-X Tables option.

Capture for structured query language and data system is licensed at $1,000.

SPSS, 444 N. Michigan Ave., Chicago, Ill. 60611.

■

Evansville Data Processing Corp. has introduced **GENC81,** a generator of Cobol code for use with Digital Equipment Corp.'s Cobol 81 or VAX Cobol.

The GENC81 is said to be capable of producing a Cobol source file that can be compiled for screen maintenance of files or tables. It builds and maintains indexed files, such as customers, tables, products and schedules.

The Cobol program created by GENC81 opens an indexed file for I/O, and if the file does not already exist, it will create one.

The GENC81 code generator is priced at $1,980.

Evansville Data Processing, 1010 S. Weinbach Ave., Evansville, Ind. 47714.

Utilities

Telesis Systems Corp. has introduced the **CV Compatibility Option** data transfer utility.

The CV Compatibility Option is said to permit printed circuit-board drawings to be transferred between Telesis and Computervision Computer-Aided Design and Drafting 4 and 4X systems.

It also permits Computervision-resident drawings to be converted into Telesis-compatible data for a phased migration to the Telesis workstation environment, according to the vendor.

The CV Compatibility Option creates a formatted ASCII file that can be transferred to a Computervision system via magnetic tape.

Available in October, the CV Compatibility option costs $7,500.

Telesis Systems, Two Omni Way, Chelmsford, Mass. 01824.

■

Macro 4, Inc. has introduced the **Foreman** forward recovery management system.

Foreman is said to offer the means to recover from data loss or corruption.

For users of software products such as Cincom Systems Inc.'s Mantis, Foreman reportedly ensures VSAM data set integrity as well as integrity for on-line development.

The system recovers any number of VSAM data sets in a single run by processing journal files created by CICS during the daily on-line session, according to the vendor.

Foreman can archive journal files to a secure tape or disk file. It also incorporates a self-checking routine.

Foreman runs on IBM 370 mainframes.

The management system leases for $150 per month.

Macro 4, Millbrook Plaza, Mount Freedom, N.J. 07970.

■

Help/38 Systems, Inc. has announced **Design Maker** for IBM System/38 computers.

The instant prototyping feature of Design Maker lets users see what the system will look like before any programming is done, according to the vendor.

Design Maker also is said to allow programmers to create and present both screen and design reports in a matter of minutes using an interactive editor.

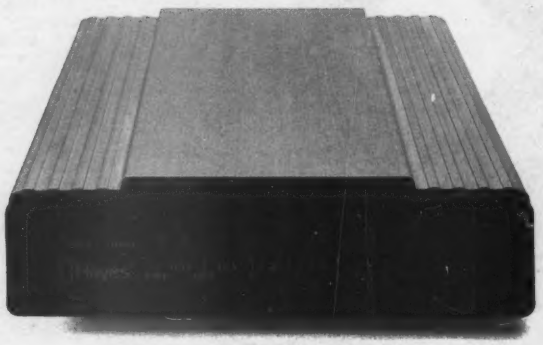
Additional features of Design Maker allow programmers to speed up design with line move, block move and save and copy functions, according to the vendor.

Users can also simulate designs for fast prototyping and create prototypes with the right display attributes.

Design Maker carries a price tag of $1,095.

Help/38 Systems, 210 Baker Technology Plaza, 6101 Baker Road, Minnetonka, Minn. 55345.

With one Hayes Transet 1000® you can do three things at once.



Think

You can keep working with your computer.

Communicate

While receiving electronic messages from your modem.

Print

While your printer is printing another job.

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*Manufacturer's estimated retail price.

We call it triple tasking.™ Transet 1000 helps your productivity, by allowing you to perform three separate computer tasks. Simultaneously. No more waiting for one task to be completed before you can begin another. And no more wasted time!

Transet 1000 keeps working for you—even when your computer is turned off. Because it has its own independent memory, Transet 1000 can serve as an electronic mailbox. Your files and incoming messages received through your modem remain stored overnight, or whenever you're away from the office. When you return, you can print out your mail without turning your PC on. Or, read it on your PC screen and print out only selected messages. You can even read your mail from any remote PC or terminal with a modem.

Before now, you would have had to buy several add-on devices to do all this. And *that* could be costly.

But no more. Transet 1000 does it all—for a surprisingly low price. It costs only $399* for the 128K model, which stores up to 90 pages. And only $549* for the 512K version, with up to 360 pages of storage.

So wait no more. If you need this flexibility in your operation, you should have a Transet 1000. See your authorized Hayes dealer for a demonstration. Or contact Hayes for information at 404-441-1617.

Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, Georgia 30348.

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Say yes to the future

Training software

Version 6.0 of **Phoenix**, a computer-based training system, is out from **Goal Systems International, Inc.**

The Phoenix system is a computer-based authoring system that allows for the presentation of prepackaged courses and the development of custom courses. Version 6.0 has micro-to-mainframe transportability and authoring editors that feature color and graphics.

The Phoenix authoring system, Ease, includes word processing capabilities for setting margins, indentation, tabs and word wraps, as well as for editing and changing, according to the vendor.

Phoenix for IBM mainframes costs $1,440 per month for a one-year license.

Goal Systems International, Goal Systems Building, 5455 N. High St., Columbus, Ohio 43214.

■

Goal Systems International, Inc. has introduced **The Securities Business**, a computer-based training course.

In nine course units, users reportedly are given an overview of how the securities industry operates.

The beginning units discuss the different kinds of securities and securities investments, including stocks, bonds, funds, mortgage loan pools, options and futures.

Later units discuss the jobs of the various industry agents and explain what is involved in the acquisition, movement and disposal of securities, according to the vendor.

The Securities Business annual license fee is $4,319.

Goal Systems International, Goal Systems Building, 5455 N. High St., Columbus, Ohio 43214.

MICROCOMPUTERS

Software applications packages

Bishop Graphics CAD Systems Corp. has released **Quick Circuit Version 3.0** of its computer-aided design and manufacturing software for printed-circuit board design.

Quick Circuit Version 3.0 includes a Library Page, said to be designed to save time by providing a selection of already drawn, commonly used components and storage module drive pads.

Other features of Version 3.0 include memory compaction, up-to-the-second reading on the amount of memory available for completing layouts and a Set Grid feature that lets users select grid-size spacing from 0.001 in. to 1.0 in.

Quick Circuit operates on Apple Computer, Inc. computers.

The software carries a price tag of $695.

Bishop Graphics CAD Systems, P.O. Box 5007, 5388 Sterling Center Drive, Westlake Village, Calif. 91359.

■

Communication Dynamics, Inc. has released its **Timepiece** project management software package for the IBM Personal Computer and compatible microcomputers.

Timepiece is said to allow easy management of several projects using a common pool of resources that can be tracked across the projects.

The software automatically calculates a project's critical path, slack time and ending date as information is entered, according to Communications Dynamics.

Timepiece includes features such as variable time units, multiple levels of subprojects and calendars that can be customized for each project.

The Timepiece package is priced at $695.

Communication Dynamics, Suite 200, 7300 S.W. Hunziker, Tigard, Ore. 97223.

■

Bran Software, Inc. has introduced **Bingo**, software that is said to aid business-to-business advertisers in tracking reader response inquiries to their advertising and publicity releases.

Bingo is said to provide information dealing with orders received against inquiries, which publications generate more responses and which types of promotions develop more leads.

Bingo generates 16 reports, including a 30-, 60- and 90-day follow-up report as well as a series of reports by publication, product, campaign and inquiry type.

The system also provides on-line inquiry sort and retrieval capability, according to the vendor.

Bingo runs on the IBM Personal Computer, Personal Computer XT, AT and compatibles. It is priced at $395.

Bran Software, 200 Motor Pkwy., Hauppauge, N.Y. 11788.

■

Boeing Computer Services Co. has released **Version 3.00E** of **Boeing Calc**, the company's three-dimensional spreadsheet software for the IBM Personal Computer, Personal Computer XT, AT and compatible machines.

Version 3.00E is said to work with files containing up to 16,000 rows, 16,000 columns and 16,000 pages. Version 3.00E features include sparse matrix file compression — said to reduce memory requirements by one-third — greater capacity and increased operating speed, according to the vendor.

The software is said to read and write all versions of Lotus Development Corp.'s 1-2-3 and Symphony work files.

Boeing Calc Version 3.00E is priced at $399.

Boeing Computer Services, 7980 Boeing Court, Vienna, Va. 22180.

■

Golden Software, Inc. has introduced **Grapher**, a menu-driven graph program.

Grapher reportedly allows the user to visualize the implications of logarithmic and linear data. Graph types include linear-linear, log-log, triangular and high-low-close.

According to the vendor, data may be represented by five types of regression curves and four types of error bars.

An unlimited number of data scales and data lines may be combined on one graph. Grid lines can be automatically generated.

Grapher runs on the IBM Personal Computer, Personal Computer XT, AT or compatibles. The program is priced at $199.

Golden Software, P.O. Box 281, Golden, Colo. 80402.

■

Pick Systems has introduced **Accu/Plot II**, said to provide full graphics capabilities that allow the transformation of number stacks into charts and graphs.

Accu/Plot II allows the user to retrieve data from any file and format it in simple bar, line or pie charts, detailed stacked bar graphs, scatter diagrams and pie charts with highlighted segments, according to the vendor.

The package features automatic scaling, labeling, line and bar pattern and color selection as well as the ability to interface with Pick System's electronic spreadsheet program, Compusheet+.

Accu/Plot II operates on the IBM Personal Computer XT, Personal Computer AT and compatibles such as Compaq Computer Corp.'s Plus and Deskpro and the AT&T Personal Computer 6300.

Accu/Plot II carries a price tag of $295.

Pick Systems, 1691 Browning, Irvine, Calif. 92714.

Software languages

STSC, Inc. has released **Version 6.0** of the **APL-Plus** application development system and APL interpreter for personal computers.

Features of Version 6.0 include larger APL variables allowing for the manipulation of more data in the APL work space and support for the Hewlett-Packard Co. Laserjet Plus printer.

Another feature is the inclusion of display drivers that provide APL characters on the IBM Color Graphics Adapter, Hercules Computer Technology, Inc. monochrome graphics adapters and compatibles without requiring a replacement character read-only memory.

Bundled applications that perform complex number calculations and determine roots of complex functions are also included, according to the vendor.

Version 6.0 of APL-Plus is available this month.

According to STSC, the system is priced at $595.

STSC, 2115 E. Jefferson St., Rockville, Md. 20852.

When you need data security, AJ has the solution.

AJ's new 1200 and 2400 bps modems give you the foolproof security feature— callback.

The AJ 1212-AD3H and AJ 2412-AD3H offer callback security. After a caller enters a correct code sequence to log onto the modem, the modem drops the line and calls back one of 25 designated numbers stored in nonvolatile memory. These new modems stop intruders before they get to your computer!

Both modems are Hayes "AT" compatible, provide a full featured memory dialer, and include other security features—answerback, two-level password protection, selective number display, downline loading, and automatic logon.

And the new AJ Data•Safe system offers the ultimate security feature—DES encryption.

Send the coupon for details.

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Anderson Jacobson, Inc., 521 Charcot Avenue, San Jose, California 95131, (408) 435-8520.

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Software utilities

Decision Graphics, Inc. has introduced **ACI/PC**, a computer-aided design Autocad/Intergraph Transfer package for Microsoft Corp.'s MS-DOS-based systems.

Autocad is a product of Autodesk, Inc., and Intergraph is made by Intergraph Corp.

ACI/PC is said to provide direct conversion between Autocad 2.0 Drawing Interchange Files and Intergraph Design Files. ACI/PC features conversion of all drawing entities including elliptical arcs, blocks/cells, layer/levels, line style, colors and text styles.

ACI/PC also incorporates features such as automatic control file generation, cell library handling, specification parameters and support for elliptical arcs.

The ACI/PC package is priced at $3,500.

Decision Graphics, Suite 1622, 555 Sparkman Drive, Huntsville, Ala. 35816.

Software data base management systems

Palantir Software has announced **Windows Filer**, a data management system for Microsoft Corp.'s Windows.

Windows Filer is said to allow the Microsoft Windows user to create custom entry forms, perform calculations, sort on any combination of fields and create numerous indexes.

Windows Filer also enables the user to combine graphics with data. The software can share data with other Windows applications. According to the vendor, Windows Filer can sort or print reports in the background while the user is working in other Microsoft Windows applications. Windows Filer reportedly gives the user up to 300 fields per data form.

Windows Filer costs $145.

Palantir Software, Suite 100, 12777 Jones Road, Houston, Texas 77070.

■

Practical Marketing Software, Inc. has introduced the **Prospect List Manager** data base customer and prospect management program.

From the Prospect List Manager's menu, the user can enter the names, addresses and other important information about customers and prospects.

According to the vendor, the same menu can create, edit and print personal letters, labels, follow-up reminders, telemarketing questionnaires and other desired hard copy. All records in the data base can be indexed and sorted in a variety of ways.

The program operates on the IBM Personal Computer, Personal Computer XT, AT or compatibles with 512K bytes of memory.

The Prospect List Manager costs $89.

Practical Marketing Software, Suite 601, 15107 Maderia Way, Maderia Beach, Fla. 33708.

Software enhancements

D. L. Hiller & Associates has released **Factory Data Manager Version 2.0**.

Factory Data Manager is said to be a labor data collection system that can keep track of what specific workers do during the workday.

Features of Version 2.0 include restart and recovery capability and support for the AT&T Unix operating system as well as for Microsoft Corp.'s MS-DOS. It also now reportedly supports the Automotive Industry Action Group-approved bar code label generation for the Hewlett-Packard Co. Laserjet and Epson America, Inc. emulation printers. Manufacturing Automation Protocol compatibility is assured, according to the vendor.

The Factory Data Manager is provided on a 12-MHz IBM Personal Computer, Personal Computer AT or compatible or on a software-only basis.

The Factory Data Manager costs $4,995.

D. L. Hiller & Associates, 14536 Island Drive, Sterling Heights, Mich. 48078.

■

Wilcom Products, Inc. has introduced **S2000**, a software package for IBM Personal Computers and compatibles said to enhance the automated testing capacity of Wilcom's Smarts test system.

The S2000 program allows the PC user to communicate with Wilcom's T328 Master Test Line and Controllers situated at remote locations within the network. With the S2000, the information required to establish the testing data base can be downloaded to the T328 Master Test Line and Controller from a PC terminal. The S2000 provides the ability to calculate completion of testing times.

The S2000 package costs $5,000.

Wilcom Products, P.O. Box 508, Laconia, N.H. 03247.

Communications

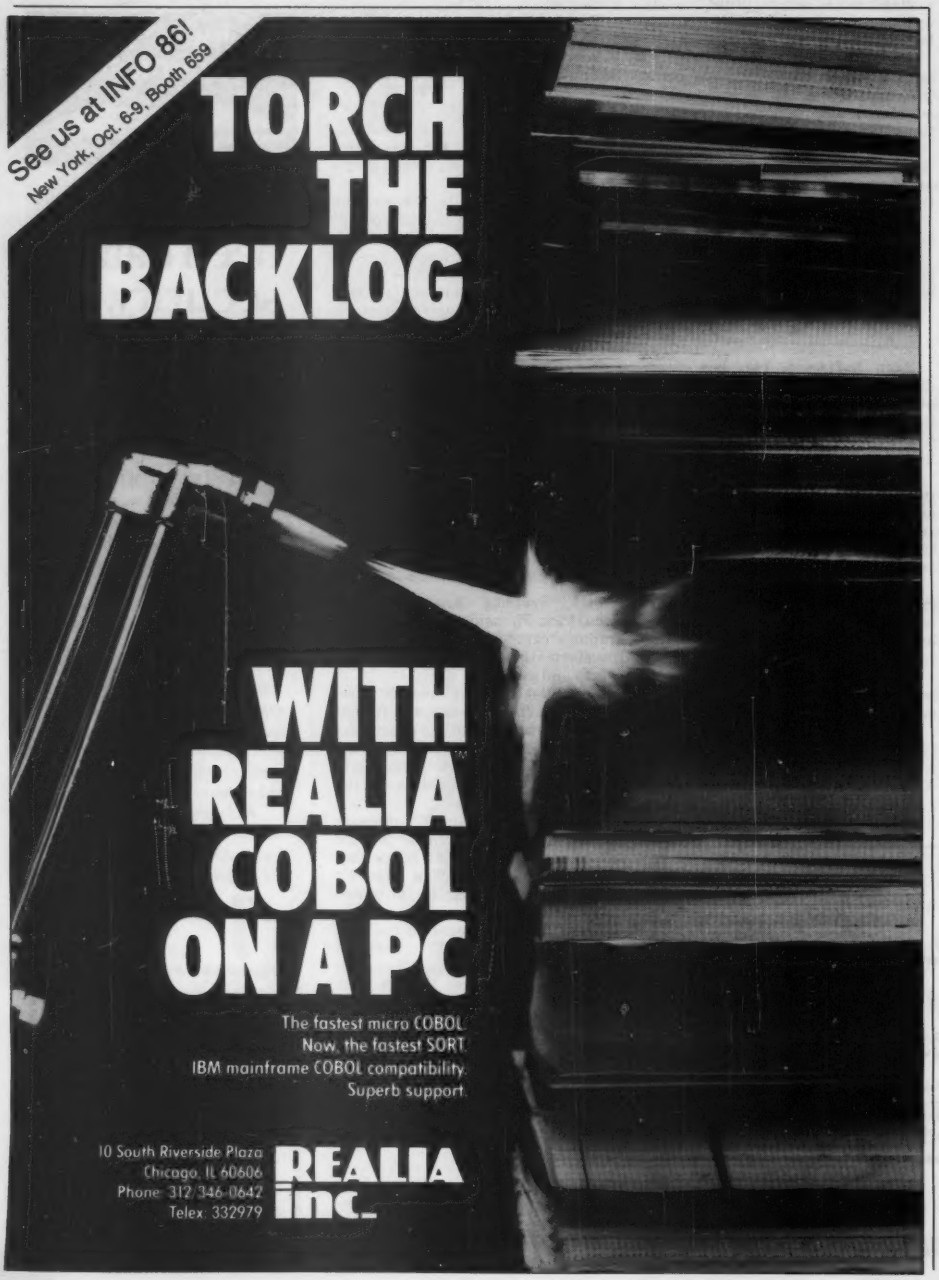
Prometheus Products, Inc. has introduced **Promodem 1200B/2**, a half-card modem that plugs into an expansion slot of the IBM Personal Computer and compatibles.

The modem is said to utilize AT&T's 212A and 103 protocols and is compatible with Hayes Microcomputer Products, Inc. command set.

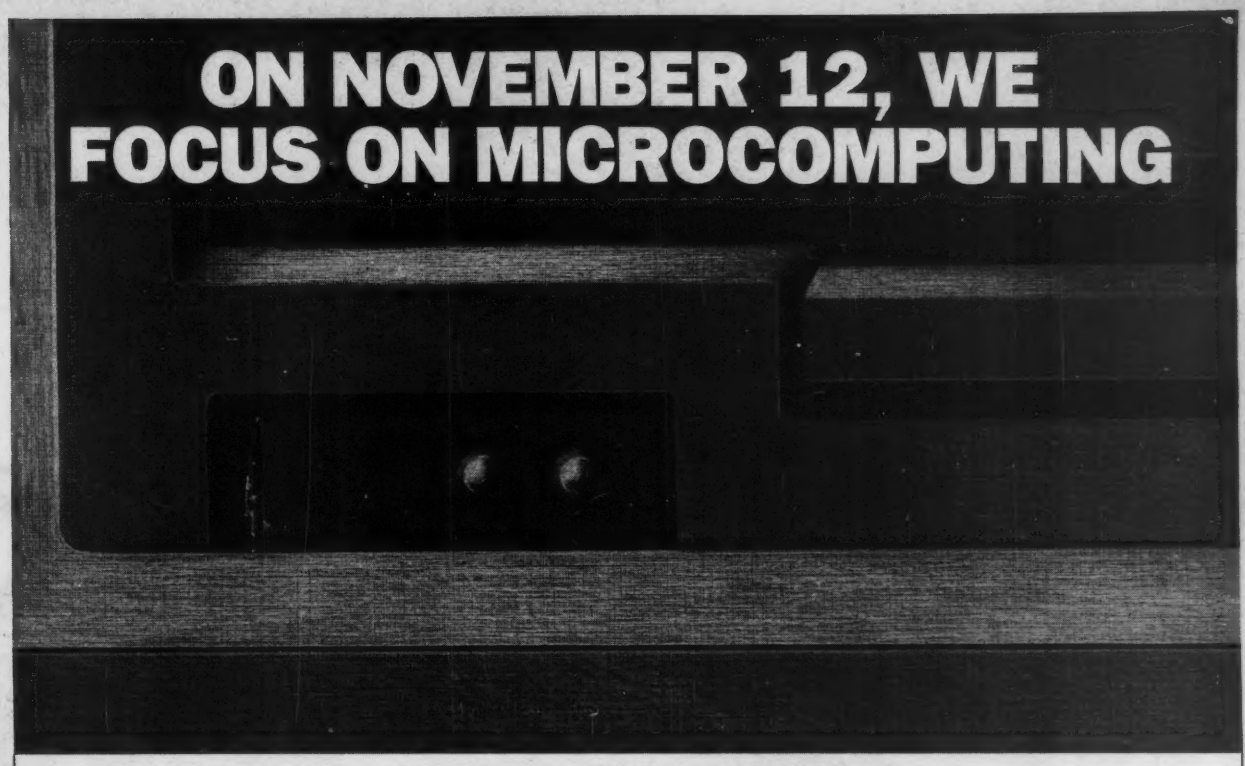
Features of the modem include autoanswer/autodial, autoredial upon busy detection, two phone jacks for switching between voice and data, a speaker with volume control, automatic tone- or pulse-dial sensing and a third serial communications port.

Promodem 1200B/2 costs $349.

Prometheus Products, 4545 Cushing Pkwy., Fremont, Calif. 94538.



ON NOVEMBER 12, WE FOCUS ON MICROCOMPUTING



Not long ago, no one outside the computer industry had ever heard of a micro or personal computer. Nor would anyone have guessed that micros would be found in abundance on desks all over the business world.

The fact is, micros have taken off. And they may well have the brightest future of any segment of the industry. So where will they take us?

Our November 12 issue of Computerworld Focus will provide some answers. With coverage of the micro field from supermicros to lap-top computers, peripherals to storage, all the way to service and support. We'll even give inside information on the future product paths of popular vendors.

Then we'll zero in on desktop publishing.

In November we'll devote our special section to one of the newest and most productive applications for the micro — desktop publishing. We'll look at what's available, what's still missing, and where the market is going.

We'll find out which products are best suited for what types of applications, and which vendors are doing what. And finally, we'll learn just what it would take for an MIS manager to make a commitment to desktop publishing.

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But hurry, closing is October 3.

For more information, contact Ed Marecki, Vice President/Sales, Computerworld Focus, 375 Cochituate Rd., Framingham, MA 01701-9171, (617) 879-0700. Or call your local Computerworld sales representative.

Issue: November 12 - Closing: October 3

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Our Pinwriter® P5XL printer has changed forever the way people look at dot matrix printing.

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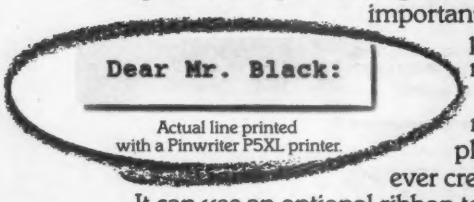

Actual line printed with a Pinwriter P5XL printer.

Fast, black letter-quality printing will be the primary reason many people will buy a P5XL printer. But there are plenty of other good reasons. In fact, it's the most versatile printer ever created for personal computers.

It can use an optional ribbon to print seven other colors plus black. And it has the best graphics resolution of any impact printer you can buy, due in part to our advanced 24-pin printhead. Plus it can print more type faces automatically than any other dot matrix printer. And it's quiet and fast.

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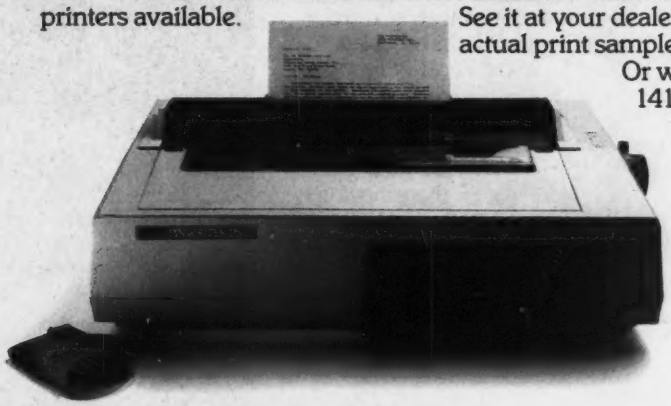
The Pinwriter P5XL is the latest addition to the most advanced and extensive family of 24-pin printers available. See it at your dealer or for an information package that includes actual print samples, call 1-800-343-4418 (in MA 617-264-8635).

Or write: NEC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719.



NEC PRINTERS. THEY ONLY STOP WHEN YOU WANT THEM TO.

NEC

NEC Information Systems, Inc.

Corvus Systems, Inc. has introduced its **Constellation File Service** software.

The Constellation File Service is said to allow IBM Personal Computer- and Personal Computer AT-compatible workstations on a Corvus Omninet local-area network to support Microsoft Corp. MS-DOS 3.1 file service.

The software reportedly eliminates the need for additional file service hardware, while allowing all users on the system to share the Omnidrive volumes simultaneously.

It is also said to be ideal for Omninet networks with a mixture of workstations, including IBM PCs and Apple Computer, Inc. Apple IIs.

Available in the fourth quarter, Constellation File Service is priced at $495 per network.

Corvus Systems, 2100 Corvus Drive, San Jose, Calif. 95125.

Printers/Plotters/Peripherals

Metrabyte Corp. has announced **Mini-Printer-24**, a 24-col. digital panel printer.

The printer is said to interface to any Centronics Data Computer Corp. parallel port and produce dot matrix output on thermally sensitive paper.

According to the vendor, its character set is made up of 250 letters and symbols and includes all 95 standard ASCII upper and lower case letters, numerals and symbols.

Features include a built-in memory buffer and character generator.

The Mini-Printer-24 is priced at $199.

Metrabyte, 440 Myles Standish Blvd., Taunton, Mass. 02780.

Board-level devices

IBM has introduced its **Enhanced Graphics Adapter Jumper Card** for the IBM Personal Computer.

The Enhanced Graphics Adapter Jumper Card supports IBM's Infowindow Display by providing an external synchronization from the display that allows the text and graphics stored on an IBM PC to overlay the video stored on a videodisk player.

The Jumper Card is installed on the feature connector of the IBM PC Enhanced Graphics Adapter. It connects to the PC's general-purpose interface bus adapter.

The Enhanced Graphics Adapter Jumper Card is priced at $40.

IBM, 1133 Westchester Ave., White Plains, N.Y. 10604.

Auxiliary equipment

Datapoint Corp. has introduced the **Starlift System**, which is said to allow users to add terminals through the addition of adapter cards in the CPU box.

The Starlift System comes with the 8216 terminal, which reportedly emulates the keyboard, screen attributes and character sets of the IBM Personal Computer AT. The system provides for the addition of up to 17 workstations.

According to the vendor, each Starlift adapter card includes an 8-MHz CPU and either 512K bytes or 1M byte of memory.

The additional memory is said to allow disk-caching for improved performance.

The system reportedly provides multiple users with simultaneous access to Microsoft Corp. MS-DOS applications.

A Starlift System, consisting of a 60M-byte hard disk and 9.68M bytes of memory, is priced at $1,937.

Datapoint, 9725 Datapoint Drive, San Antonio, Texas 78284.

COMMUNICATIONS

Software

Joiner Associates, Inc. has announced **Version 3.0** of **Jnet**, networking software for Digital Equipment Corp. VAX VMS to IBM VM communications. It is said to permit file transfer, electronic mail exchange and interactive communication on a peer-to-peer basis.

Improvements in Version 3.0 include a shared router; a network monitor utility that shows network traffic, the configuration of links and servers and CPU utilization; improved network printer capabilities; and additional support for Vaxclusters.

Jnet runs under VMS Version 4 and is priced by VAX model. Jnet license fees range from $6,000 to $19,500.

Joiner Associates, P.O. Box 5445, 3800 Regent St., Madison, Wis. 53705.

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Herman Melville would have loved it. With a 9600VP high-speed modem, he could have sent his *Moby Dick* manuscript–all 1.2 million characters–from his PC to his publisher in less than half an hour, error-free. With a 1200 bps modem, the same trip would have taken more than 2 ½ hours.

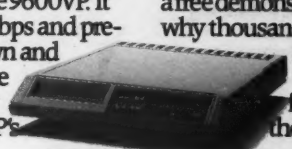
Alas, the 9600VP arrived about 150 years too late for the seafaring author. But not for companies that need to pilot whale-size files through the switched phone network, where you need a lot more than speed: you need performance.

No other dial-up modem performs like the 9600VP. It cruises at 9600 bps and precisely slows down and speeds up as line conditions vary. And the 9600VP's dependable high-speed error control only retransmits bad data blocks–and nothing else.

The 9600VP won't make waves in your existing network, either. It works in sync and async, with PCs and terminals, with 212s and 103s. In fact, it's made to work with every kind of modem, computer and communication software you're likely to find on a dial-up network today.

And the 9600VP not only costs less to buy, but saves a lot of money in line charges and personnel time. So it won't cost you an arm and Captain Ahab's other leg.

So call Racal-Vadic today at 800-482-3427, and ask for a free demonstration. Then see why thousands of 9600VPs are already out there moving fat files through the real world.



Racal-Vadic

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Simware, Inc. has announced **SIM/NTO**, a host-based software product said to eliminate the need for SIM3278/VTAM users to install IBM's Network Terminal Option (NTO) on the communications front-end processor.

SIM/NTO runs as an MVS/VTAM application in conjunction with Simware's host-based protocol converter, SIM3278/VTAM.

It is said to enable all ASCII terminals and personal computers currently supported by SIM3278/VTAM to communicate asynchronously over EP lines with MVS/VTAM applications.

The price of SIM/NTO is $7,500.

Simware, 14 Concourse Gate, Nepean, Ont., Canada K2E 7S6.

Multiplexers/Modems

Prentice Corp. has introduced the **P-9600FP**, a 9.6K bit/sec. modem for use on multipoint networks.

The P-9600FP is said to offer four-wire, full-duplex, synchronous operation over multipoint private lines. It can also operate as a V.29 point-to-point modem.

The P-9600FP features test capabilities for local and remote diagnostics to ensure trouble-free operation.

It also features rates of 7.2K bit/sec. and 4.8K bit/sec. to accommodate deteriorated line conditions, according to the vendor.

The P-9600FP is priced at $1,995.

Prentice, P.O. Box 3544, 266 Caspian Drive, Sunnyvale, Calif. 94088.

■

Artel Communications Corp. has announced that its **3270** multiplexers now have **RJ-11** telephone jacks.

The RJ-11 jacks are built into the terminal ports of the Slimline Terminal multiplexer so that ordinary telephone wire can be used instead of coaxial cables to connect terminals to the multiplexer, the vendor said.

An eight-port coaxial or RJ-11 pair terminal multiplexer is priced at $700; the 16-port multiplexer costs $1,350.

Artel Communications, P.O. Box 100, West Side Station, Worcester, Mass. 01602.

Local-area networks

American Photonics has introduced its **RL5000 Ethernet Expander Model 2** that serves as an interface between a standard Ethernet transceiver cable and optical cable.

The RL5000 is a fiber-optic system said to expand the range of Ethernet workstations or file servers to 3 km from the network, without local or remote repeaters.

It is said to eliminate the signal delays and cabling of remote repeaters with associated transceivers and dummy coaxial segment hookups.

The RL5000 costs $2,250.

American Photonics, 71 Commerce Drive, Brookfield Center, Conn. 06805.

Auxiliary equipment

Intermec Corp. has unveiled **Crossbar**, its bar code data collection network.

Included in the Crossbar network are the 9512 Transaction Manager, the 9511 Bar Code Terminal and the 9510 Bar Code Reader, all of which offer decoding on all major bar code symbologies, including industry standard Code 39.

The products have the following prices: 9510, with wand powerpack, costs $495; 9511, with display and wand powerpack, costs $845; 9512, with display and wand powerpack, costs $1,095; 1700 Keyboard costs $225; 9191 Satellite Wand Station costs $195; and the 8635 Turbo Bar Code printer costs $4,495 or $4,895, depending on the print head.

Intermec, P.O. Box 360602, 4405 Russell Road, Lynwood, Wash. 98046.

SYSTEMS & PERIPHERALS

Processors

Matrox Electronic Systems, Inc. has announced its **VIP-1024** single board for real-time image acquisition and display for Motorola, Inc. VMEbus systems.

The VIP-1024 has the analog-to-digital, the digital-to-analog and the frame buffer on a single board. The board was designed with expansion capabilities for user hardware, allowing it to communicate with the user's own custom image processing software.

The VIP-1024 has 1M byte

Continued on page 117

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ITT QUME

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Continued from page 115

of random-access memory. Each image in the frame buffer uses 8 bit/pixel.

The VIP-1024 board costs $2,995.

Matrox Electronic Systems, 1055 St. Regis Blvd., Dorval, Que., Canada, H9P 2T4.

Data storage

Storage Concepts, Inc. has introduced the **VME21 Plus** parallel transfer disk (PTD) storage system for use with VME-based computer systems.

The VME21 Plus is said to offer a sustained transfer rate of more than 8M bit/sec. for data transfer of up to 9.3M bit/sec. The system consists of a rack-mountable disk processor, two 170- by 233-mm standard-size VME board assemblies, a parallel transfer disk and a device driver for the Unix operating system.

VME21 Plus, utilizing the Fujitsu Ltd. M2350A PTD, transfers data to and from the M2350A via five parallel channels, each at a 1.86M bit/sec. transfer rate, the vendor stated. Data may be transferred to the VME21 Plus via either single- or five-channel parallel data transfers at 1M and 8M bit/sec., respectively.

A complete VME21 Plus system with one M2350A PTD costs $45,700.

Storage Concepts, 3198-G Airport Loop Drive, Costa Mesa, Calif. 92626.

Terminals

Codonics, Inc. has introduced the **GT 100 Graphics Upgrade Kit** for Tandy Corp.'s DT 100 data terminal.

The GT 100 is said to provide the DT 100 with features such as vector mode, point plot, incremental point plot, multiple character sizes and line styles. Instantaneous Pan and Zoom features are executed via the keyboard without having to redraw the picture, according to the vendor.

The upgrade kit reportedly provides a 1,024- by 800-pixel graphics display and a 1,024- by 1,024-pixel physical memory area.

According to the vendor, the kit provides a vector drawing of over 1,000 pixel/sec. and a 38.4K bit/sec. transmission rate.

It comes with an amber or green screen.

The GT 100 Graphics Upgrade Kit costs $1,095.

Codonics, 18001 Englewood Drive, Middleburg Heights, Ohio 44130.

■

Ann Arbor Terminals, Inc. has added the **Model AMB-0030** to its line of XL series terminals.

According to the vendor, the Model AMB-0030 incorporates the features of the company's Ambassador XL while adding the ability to select either 20-mA current loop or RS-422 interfaces through the use of active cables connected to the unit's control panel.

The product also features alpha-zoom control, which allows the user to reconfigure display formats and ergonomic requirements, the vendor stated.

Other features of the XL series include the addition of host-selectable communications parameters including bit/sec. rate, parity and X-On and X-Off controls.

The XL series terminals are priced at $1,395 and up.

Ann Arbor Terminals, 6175 Jackson Road, Ann Arbor, Mich. 48101.

Printers/Plotters

Genicom Corp. has unveiled its **Model 3210** dot matrix printer.

The Model 3210 prints 240 char./sec. in draft mode and 60 char./sec. in letter-quality mode.

The printer comes with both parallel and serial interfaces and is said to work with the IBM Personal Computer as well as other popular desktop computers.

The front panel of the printer allows selection of character style, pitch, print mode and self-test, according to the vendor.

The Model 3210 offers a variety of printing, including emphasized, double-strike, superscript and proportional spacing. The printer, rated at 55dba, has a standard 2K-byte buffer with 8K bytes optional, according to the vendor.

The Model 3210 costs $1,495.

Genicom, One General Electric Drive, Waynesboro, Va. 22980.

Auxiliary equipment

Everest Electronic Equipment has introduced its line of five **shielded cabinets.**

The cabinets are said to house Digital Equipment Corp. PDP-series CPUs and peripherals with similar form factors. I/O panel space is provided for 24 to 56 communication lines, and each cabinet is furnished with 120 value-added carrier power controllers.

The line includes the IEH9642-FA, priced at $1,975; the IEH9642-FC, priced at $1,850; and the IEH9647-AA, priced at $2,975.

Everest Electronic Equipment, 2100 Orangewood Ave., Anaheim, Calif. 92806.

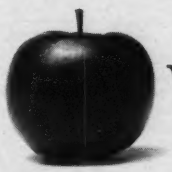
■

Datem Ltd. has introduced the **DDCM804 Bitbus** interface adapter, said to allow VME systems to take advantage of Intel Corp. Bitbus distributed control network products.

The DDCM804 is said to provide an interface between the Synchronous Data Link Control-based serial Bitbus interconnect and the standard VME backplane. The module supports a bidirectional first-in first-out interface and contains three memory sites populated with one 8K-byte by 8-chip erasable programmable read-only memory and two 8K-byte by 8-chip static random-access memories.

The DDCM804 is priced at $575.

Datem, 148 Colonnade Road, Nepean, Ont., Canada K2E-7R4.



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DALLAS

* McIntosh, the apple you eat.

COMPUTER INDUSTRY

Section begins on page 146

Odd couple: Tarkenton, Martin merge to automate software

Pair dedicated to totally integrated architecture

By Alan Alper

NEW YORK — This is a story of contrasts.

It is a story of a software development guru teaming up with a professional football player turned productivity maven. Moreover, it is a story of the merging of two companies dedicated to automating, and thereby accelerating, the software development cycle.

Fran Tarkenton

Knowledgeware, Inc., founded by information systems design authority James Martin, has merged with Tarkenton Software, Inc., a firm started by Pro Football Hall of Fame quarterback Fran Tarkenton. The merger was effected through the exchange of stock by the two private firms' principals. The new firm retains the Knowledgeware name with Tarkenton as chief executive and chairman and Martin as chairman emeritus.

The merger, however, links two improbable suitors.

Tarkenton, also a TV personality and author, is recognized for his work in human resource productivity and advertising. Within the computer industry, he is also known for the consulting role he played at Management Science America, Inc. when that company experienced hard times. Tarkenton exudes charisma, a quality reflective of a one-time quarterback.

Martin, a noted author, consultant and seminar speaker, is reserved. He comes across as an academician rather than an entrepreneur, and he espouses the use of engineering-like disciplines and automated tools to develop information systems.

How did these two businessmen get together?

"We met in Dallas about four months ago," Tarkenton recalls, noting that he has revered Martin ever since he heard about his theories 12 years ago. "We shared a limo ride to the airport and in 45 minutes, realized that there was great synergy between us and the companies."

Both men realized that, from a technology perspective, the firms' products were attempting to solve different ends of the same problem.

Founded as Database Design, Inc. in 1979, Ann Arbor, Mich.-based Knowledgeware develops front-end software development tools using structured programming to expedite the construction of information systems. Four-year-old Atlanta-based Tarkenton Software has created back-end, mainframe-based tools for developing and maintaining application systems.

James Martin

The merged entity, according to Tarkenton and Martin, represents the first firm that will provide a totally integrated environment for analysis, design and application code generation. "If you don't automate all lines of the product life cycle, it's like running a clockwork mechanism without some of the gears," Martin says. "The key is creating a totally integrated architecture, and you can't do that unless you have one company, one management and one marketing organization."

More than technology, the new Knowledgeware is also offering consulting services on information engineering methodologies and product use, as well as counseling on human resource management techniques.

The combination of these elements is expected to help Knowledgeware make inroads into the MIS community. Better development tools could help counteract an ever-expanding data processing backlog that experts feel is approaching eight years, double the publicly stated figure, Tarkenton says.

Project development could also be expedited, he says. While American Airlines' Sabre airline information took 10 years to take form a decade ago, firms today can not wait that long for so-called "mission critical" systems to be developed, Tarkenton notes.

"Using our combined set of tools, Sabre would have taken how long to develop?" Tarkenton asks Martin.

"About two or three years," Martin chimes in.

A recent report from Alex Brown & Sons indicates that corporations will increase expenditures on information systems by 200% to 300% during the next five years. Much of this investment, it says, is predicated on developing tools to build structured information systems for mission critical applications.

Such research findings convince both men that the firm is on the verge of big things. Neither will say how large their companies' combined revenue is, but they expect it to continue doubling each year in the foreseeable

See **TARKENTON** page 123

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Plus, Roger has found added incentive to advertise in Computerworld: *"The same ad that runs nationally in Computerworld costs twice as much to run in the Chicago Tribune, a local newspaper,"* he notes.

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Computer industry emerging from slump, but gold-rush days are over

By Mitch Betts

The computer industry advanced a bit farther out of last year's slump during the second quarter of this year, mostly due to internal cost-cutting efforts, according to an analysis by George A. Christie, chief economist for McGraw-Hill Information Systems Co. in New York.

In the latest quarter, a sample of computer firms showed profit improvement of 14% over the previous year, as sales of computer equipment rose 12%, McGraw-Hill reported. Second-quarter sales gains were strongest for peripherals and software, while above-average profit gains were scored by computer makers, the firm reported.

Christie said that while there has been a moderate increase in demand for computer equipment, the chief improvement in the industry is internal. "Cost reduction measures over the past year mean that a modest improvement in sales is resulting in a profitable 1986 for most companies," he said.

"Last year, when sales growth slowed sharply, this overextended industry took severe losses," Christie noted.

> ***'Cost reduction measures over the past year mean that a modest improvement in sales is resulting in a profitable 1986 for most companies.'***
>
> — George A. Christie
> McGraw-Hill Information Systems Co.

The industry's cost control efforts contributed to an average profit margin of more than 6% in the second quarter of this year, compared with less than 5% a year earlier, he said.

Christie said that although the computer industry is in the initial stage of recovery, it will not be returning to the boom times of the early 1980s. "Instead, this maturing industry must deal with the handicaps of heightened competition and weak business capital spending, which are bound to inhibit the next round of growth," he said.

Indeed, the U.S. Department of Commerce figures that business capital spending plans for 1986 will continue to worsen. The latest business poll, taken in July and August, showed that businesses plan to spend 1.9% less for new plants and equipment this year than last year.

In constant 1982 dollars, the business spending drop in 1986 is expected to be 2.5%, compared with spending increases of 8.7% in 1985 and 15.8% in 1984, the department's Bureau of Economic Analysis reported earlier this month.

Concerning international competition, the Computer and Business Equipment Manufacturers Association (CBEMA) recently reported that the industry's trade balance worsened in the first half of 1986.

CBEMA said the computer, business equipment and telecommunications industries retained a positive balance of trade of $1.4 billion for the first six months of 1986, but the figure represents a 34.8% decline from the 1985 figure.

Industry exports decreased by 7.5%, while imports increased 1.1%, CBEMA reported.

The computer trade deficit with Japan alone was nearly $2.5 billion in the first half of this year, up 14.4% over last year, according to CBEMA reports.

The telecommunications equipment trade deficit increased by 16.3% to $742 million, the trade association added.

Tarkenton unites with Martin

From page 118

future as they did when the firms were independent.

"It's not a question of how fast we grow but how comfortably we manage growth," Martin says.

Helping on the management and marketing sides is Big Eight accounting firm Arthur Young, which invested multiple millions in Knowledgeware — the largest investment it ever made in a company, says Richard Welsh, managing director of the firm's information technology group. Arthur Young will help the young firm expand its scope on an international basis, Welsh says.

Knowledgeware expects to have its first loosely integrated product out within the next two months.

Also promised is increased competition in the software development field, Martin and Tarkenton agree. A variety of software firms are devising integrated software development approaches that could hit the market in the short term.

While applauding these companies' efforts, Martin says the industry needs to take a broad view and not confine itself to proprietary tools for certain environments. "You can't have every data base management company doing something specifically for its environment," he cautions.

Tarkenton looks forward to the challenge of new market entrants. "If we weren't getting any competition, I'd think we were in the wrong field," he declares.

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MERGERS AND ACQUISITIONS

Rockwell International Corp. and **Electronics Corporation of America** (ECA) jointly announced the execution of a definitive agreement providing for the acquisition of ECA by Rockwell's subsidiary, Allen-Bradley Co., at a cash price of $52 per common share.

The definitive agreement provides for the merger of ECA with a wholly owned subsidiary of Allen-Bradley.

■

As part of an ongoing effort to refocus resources on OEM sales and manufacturing and to provide a broader field service network for its customers, **Beehive International, Inc.** announced the signing of a purchase agreement to sell its field services operation to **Momentum Service Corp.** of New Jersey.

According to Beehive, the purchase agreement was signed by both parties, and management expects Beehive to receive approximately $2 million related to the sale prior to Dec. 31.

■

Siltec Corp. announced it has entered into a letter of intent with **Mitsubishi Metal Corp.** that contemplates the acquisition of Siltec by Mitsubishi Metal in a cash merger.

The merger would result in the shareholders of Siltec receiving $7.95 for each share. In addition, an amount equal to 75 cents per share and any proceeds resulting from the sale of Siltec's Mountain View, Calif., facility would be placed in escrow at the time of closing, on behalf of Siltec shareholders as indemnity from certain potential claims against the company.

■

Helix Systems Ltd. has acquired, subject to Vancouver Stock Exchange approval, **Classic Systems, Inc.** of Houston.

The purchase agreement calls for Helix to issue 1,380,000 common shares of stock valued, in Canadian dollars, at $2 apiece for all of Classic's outstanding common stock. An additional 153,333 Helix shares could be issued under certain circumstances.

■

The Argo Group, Inc., Litel Telecommunications Corp. and Microtel, Inc., three private long-distance telephone companies, announced they have approved a definitive merger agreement that provides for the three firms to consolidate their businesses as subsidiaries of a newly formed corporation.

The new company's principal office will be located in Boca Raton, Fla., and will operate a domestic and international facilities-based, all-digital telecommunications system using fiber-optic and satellite facilities.

■

Tel/Man, Inc. and **Southernet, Inc.** announced an agreement in principle to merge.

Under the terms of the proposed merger, and subject to certain adjustments, the surviving company would issue approximately 4.2 million shares to former Tel/Man stockholders and approximately 7.4 million shares to former Southernet stockholders.

See **MERGERS** page 125

Israeli firm offers on-line contract listing

International service available over Tymnet

By Mitch Betts

WASHINGTON, D.C. — An Israeli firm last week announced its entry into the U.S. business market with an on-line information service called World Bid, which provides listings of U.S. and international government contract opportunities.

The on-line data base, which resides on a host computer in Israel, will be available in about two weeks via the Tymnet international data network, the vendor said. Tymnet is a service provided by McDonnell Douglas Network Systems Co., based in San Jose, Calif.

World Bid USA, the U.S. unit of Tel Aviv-based Shaked International Marketing Ltd. and Elnet Ltd., made the announcement in Washington at a briefing that featured Israeli Prime Minister Shimon Peres.

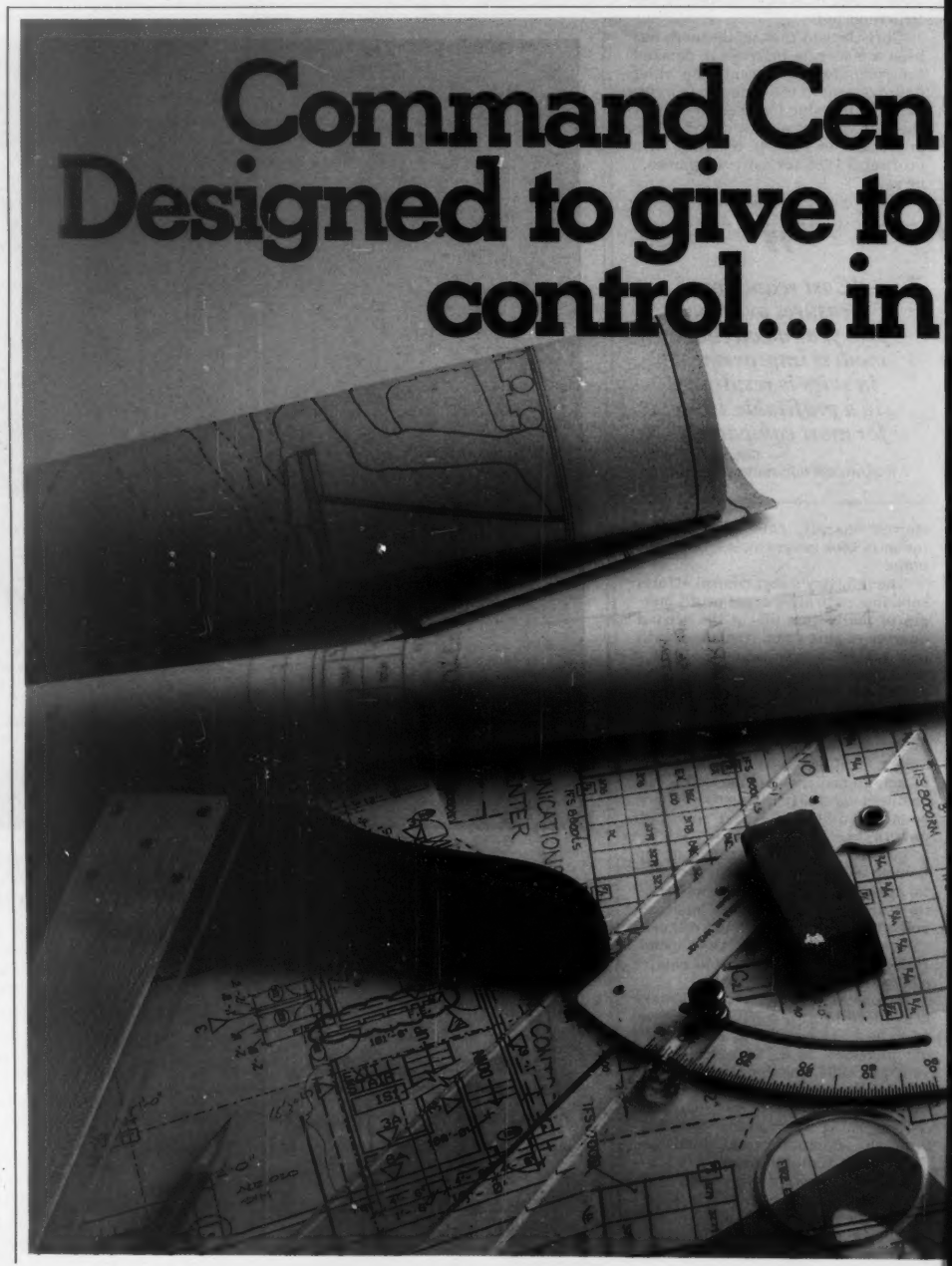
U.S., international listing prices

The service costs $45 per hour for the U.S. listings and about $75 per hour for the international listings, in addition to Tymnet network charges, officials said.

The firm has entered a crowded marketplace. Five other information vendors already offer electronic access to U.S. government contracting information compiled by the U.S. Department of Commerce.

However, World Bid officials claimed that their menu-driven system is easier to use, and they stressed that the World Bid service also provides access to international bid requests.

World Bid's international data base includes contract information from the European Economic Community, the North Atlantic Treaty Organization, the Israeli government, U.S. military bases in Europe, Strategic Defense Initiative military offices and the U.S. Information Agency's Voice of America broadcasting operation, according to company representatives.



Paradyne faces Customs Service investigation

Probe involves export regulation compliance

By James A. Martin

LARGO, Fla. — Paradyne Corp. is being investigated by the U.S. Customs Service for possible noncompliance with Export Administration Act procedures in the shipment and distribution of Paradyne products overseas.

The investigation apparently addresses the company's compliance record with export licensing requirements for the shipment of products out of the U.S. These products include modems with speeds greater than 9.6K bit/sec. and "additional telecommunications and computer products," according to Miriam K. Frazer, director of corporate communications.

Paradyne officials do not know the details of the investigation because the Customs Service has refused to discuss it with the company, Frazer said.

Company employee approached

The company learned of the investigation when two customs officials approached a company employee for questioning regarding the export of Paradyne products.

The company denies any wrongdoing in the export and shipment of its products.

"The Department of Commerce has audited Paradyne within the last year in terms of export regulations, and they indicated overall satisfaction with Paradyne's internal control program," Frazer said.

Unrelated to indictments

The investigation is unrelated to the federal grand jury indictments that accused Paradyne and key executives of fraud in December 1985.

"There should be no direct or indirect relationship," Frazer said. "They are two separate issues."

The U.S. Customs Service would not comment on the Paradyne investigation.

NCR cautiously optimistic

From page 146

Exley said he hoped NCR's commercial relationship with Sperry would continue in the aftermath of its acquisition by Burroughs. He expects the acquisition to have long-term effects on the balance of power in the industry only if Burroughs' "critical mass" objectives are attained.

"If the expectations of Burroughs management that there are some efficiencies to be gained by acquiring Sperry are proven correct, then we will have a stronger competitor to deal with," he concluded.

Prescription for revenue growth

Lacking the revenue jolt that acquiring Sperry would have given NCR, Exley offered a prescription for accelerating NCR's revenue growth during an era characterized by severe price erosion.

Exley noted that NCR must continue to offset the declining price for basic functions such as main memory, disk storage and processing power of its products by developing new products that utilize these functions to provide increased value to customers.

NCR has already embarked on that path, he noted.

Order value of Tower series

Despite substantial price reductions, the order value per average configuration of NCR's Unix-based Tower series has increased by 7% since the product family's first full year of sales in 1984.

Average revenue per unit in the personal computer-compatible business has increased 30% since 1985, Exley said.

NCR would avoid the risks associated with accelerated growth by refraining from booking a business that would negatively affect gross profit margins.

"Our approach is not to hit home runs, but to be a steady hitter of singles," he said.

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MERGERS from page 124

The Saddlebrook Corp. in Cambridge, Mass., and **Mid-Continent Computer Services, Inc.** in Denver, Colo., announced that they will become subsidiaries of a newly formed holding corporation that will be named **The Saddlebrook Corp.**

Saddlebrook will work with Mid-Continent and Salomon Brothers, Inc. to arrange financing to purchase Mid-Continent from its parent, **First Columbia Financial Corp.**

Once formed, the new corporation will have combined sales of $54 million.

■

Scientific Micro Systems, Inc., a publicly held company, has signed a definitive agreement to merge operations with **Sigen Corp.**, a Santa Clara, Calif., manufacturer of tape controllers and disk and tape storage systems for the IBM Personal Computer-compatible market.

Under terms of the agreement, Sigen's operations and employees have moved into Scientific Micro Systems' facilities in Mountain View, Calif., and will operate as product division of that firm.

SUPERSHORTS

Regis McKenna, Inc. said it will no longer represent **Intel Corp.** as a public relations and marketing strategy client. Regis McKenna acquired Intel as a client in early 1972 and handled both advertising and public relations for Intel until Regis McKenna sold its advertising business to Chiat/Day, Inc. Advertising in 1981.

■

Hewlett-Packard Co. has announced it is changing the composition of two of its principal business sectors to achieve closer linkages among related businesses.

Sectors affected by the changes are the Components, Measurement and Design Systems sector (CMDS) and the Manufacturing, Medical and Analytical Systems sector (MMAS).

The Design Systems Group, previously part of CMDS, will move to MMAS. The Design Systems Group is principally engaged in designing and manufacturing workstations and software for use in computer-aided design and engineering applications.

The Analytical Group, formerly part of MMAS, shifts to CMDS. The Analytical group employs 2,400 people in the design and manufacture of instruments and systems used for chemical analysis.

The Medical Group, formerly part of MMAS, also moves to CMDS. The Medical Group employs 4,100 to design and manufacture electronic instruments and systems for use in professional health care.

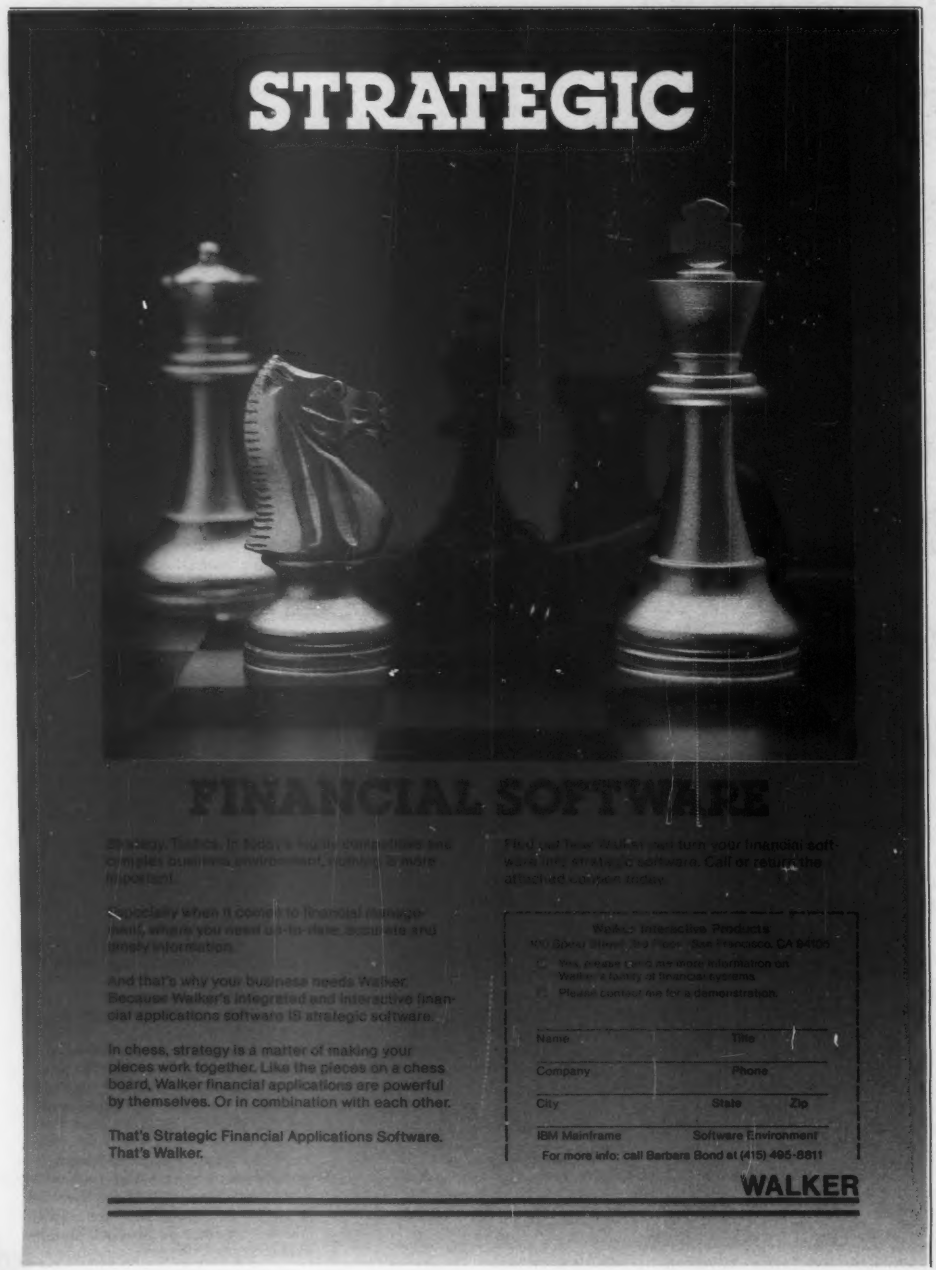
National Semiconductor Corp. of Santa Clara, Calif., won a preliminary injunction in Taipei District Court that prohibits **United Microelectronics Corp.** of Taiwan from marketing an integrated circuit that National Semi claims is based on its proprietary design.

The chip in question, a universal, asynchronous receiver transmitter, is widely used in computers.

■

Motorola, Inc. said that it has formed a new division within its General Systems Group to strengthen its effort in the supermicrocomputer market.

The new Microcomputer Division, located in Tempe, Ariz., includes the Microsystems Operation of Motorola's Semiconductor Products Sector and the Tempe operations of Motorola Computer Systems, Inc.



Affiliation may beget contempt

From page 146

tions in 2,000 cities, Quotron is still the premier vendor. The Shearson situation points out, however, that the Los Angeles firm no longer holds sway as it once did. On the other hand, to judge Quotron's prospects on a deal gone sour with AT&T seems somewhat inappropriate.

Considering AT&T's recent reorganization, perhaps it was the new regime at AT&T that was no longer committed to continuing the formal relationship with Quotron.

Incidentally, Shearson is not entirely convinced that it should disallow Quotron because of its affiliation with Citicorp. The firm continues to evaluate all options, including Quotron's products, it recently said.

Citicorp has recently gone on the offensive to explain its not-so-secret corporate strategy to become the world's leading provider of financial services. Quotron, no doubt, is a vital cog in Citicorp's stragegy.

At a recent information management conference in New York sponsored by the Securities Industry Association, Citicorp's corporate planning officer, Paul Collins, tried to allay the brokerage industry's fears of dealing with Quotron.

Collins, while acknowledging the increasing competition between Wall Street firms and the banking community, stressed the interdependence of financial services companies. Banks, he pointed out, often provide brokerage houses with credit, while Wall Street firms provide banks with research and trading services, among other things.

If brokerage firms feel that by using the Quotron service they are helping a competitor, Collins said they should think again. "Citicorp pays more to some Wall Street clients in financial service fees than they, in turn, pay to use Quotron services," he said.

To bolster the contention that Citicorp would not use Quotron to obtain proprietary information about its clients, Collins emphasized that the firm would be operated as an independent subsidiary under existing management.

He also spoke of the regulatory Chinese walls within brokerage houses and banks which, in theory, are supposed to prevent sensitive client information from falling into the wrong hands. Collins discussed "unspoken, old-fashioned walls of integrity and reputation which, if broached, can cause great damage to our institutions."

In theory, Collins has a point.

But, if the recent spate of insider trader scandals are any indication, both the Chinese and the old-fashioned walls of integrity are extremely porous. Information seems to flow between the acquisition/merger and trading departments at many Wall Street firms as swiftly as a river rushing over a waterfall.

Practically speaking, Collins is engaging in wish fulfillment. Perhaps the reason the brokerage firms fear a Citicorp and Quotron alliance is because of what has been going on within their own houses.

If that's the case, maybe they do have more to fear than meets the eye.

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CDC plans road to recovery with divestiture of subsidiary

Proceeds to lower debt, strengthen core business

By Donna Raimondi

MINNEAPOLIS — The proposed divestiture of Control Data Corp.'s successful Commercial Credit Co. could result in several million dollars in the bank for the troubled supplier of scientific and engineering computers. The move could further reduce CDC's debts, according to analysts.

Robert M. Price, the $3.7 billion company's chairman and CEO, announced earlier this month [CW, Sept. 15] that its wholly owned Commercial Credit subsidiary, which generated $1.1 billion in 1985 revenue, would become a publicly owned corporation, under the guidance of Sanford Weill, former American Express Co. president.

Under terms of the agreement, a public offering of Commercial Credit stock by CDC and a simultaneous offering by Commercial Credit would be undertaken, reducing CDC's ownership of the subsidiary to less than 20%.

Commercial Credit, headquartered in Baltimore, has assets of $5 billion and a net worth of $661 million. In 1985, it showed an after-tax loss to its parent firm of $4.8 million, according to CDC.

CDC's immediate plans are to use the proceeds from this sale to strengthen its core businesses — computers, peripherals and related services — and its capital structure. It will reduce the intercompany debt with Commercial Credit and eventually reduce CDC's overall debt-to-equity ratio, the company says.

Reducing the debt-to-equity ratio could take a while, analysts say. "They can't just find all the bondholders and say, 'We are going to pay you off now,' because the majority of their bonds are noncallable for a period of time, probably five years," explains Gary Blauer, securities analyst at Dean Bosworth, Inc.

But Blauer says he is bullish on CDC's long-term financial health. "The company is absolutely improving. It has done a lot of cost cutting, made significant management changes, and there are signs of a return to profitability," he adds.

The biggest sign is that the peripherals business, once a heavy CDC money-maker and more recently a serious drain on its profits, has turned itself around and become profitable again.

ETA Systems, Inc., CDC's supercomputer company, should have a system on the market early in 1987. While it is unlikely that ETA could turn a profit in its first year of product offerings, it at least will have some revenue to reduce its losses, according to Blauer.

Under terms of the agreement, Weill would become chairman of the board and CEO of Commercial Credit. He and others in his management group would purchase common stock of Commercial Credit.

"Weill is very well known in the financial community," Blauer says. Weill built the Shearson investment firm — now known as Shearson Lehman Brothers, Inc. — from a small operation into an industry giant before selling it to American Express.

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EXECUTIVE CORNER

NBI, Inc. of Boulder, Colo., announced the appointment of **Bernard Cohen** as president of its Office Products Division. Cohen will assume the responsibilities of former Executive Vice-President **David Klein**, who will return to NBI's Office Systems Division after a short transition period.

■

Ralph E. Gomory, IBM's senior vice-president, has been named to head an organization consolidating the company's research division and its technology assessment and university relations functions. As part of the consolidation, Gomory will assume the responsibilities of IBM chief scientist, a position now held by **Lewis M. Branscomb**, who is retiring.

■

The Communications Equipment Corp. announced that **Thomas Mercer** has been named president and chief operating officer. Formerly, Mercer held senior management positions with Wang Laboratories, Inc., Codex Corp. and Booz Allen & Hamilton, Inc.

■

Charles R. Kenmore has been named vice-president and general manager of Shared Network Services at Comsat Technology, Inc. In his new position, Kenmore will be responsible for the development, implementation, staffing and commercialization of Starcom Data Services, Comsat's new interactive, shared-data network. Prior to this, he served as vice-president of the telecommunications division for General Datacom, Inc.

■

Data General Corp. has announced the election of **Vahram V. Williamson** as vice-president of U.S. manufacturing operations, replacing **James V. Williamson**.

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Robin Schwartz is Employment and Employee Relations Manager for McCormack & Dodge, a software company based in Natick, Massachusetts. She is responsible for recruiting people for the company's home office as well as its seven regional offices across the country. And earlier this year when Robin was looking for software applications sales and support people, she chose to run an ad in Computerworld.

"*I had numerous openings for positions across the country. From a cost-efficiency standpoint, Computerworld seemed like the logical choice,*" says Robin. "*But before finalizing my decision, I did a little investigating. I talked to our sales managers here at McCormack & Dodge — and they all agreed. The #1 place to recruit qualified computer professionals nationally is Computerworld. To keep in touch with what's going on in the industry, people have to read Computerworld,*" she explains.

McCormack & Dodge is enjoying national visibility as a result of the ad, but, more importantly, Robin is quite pleased with the responses. "*My people were right. We placed the ad in the beginning of the year and received tremendous response via our two-day hot line (800 number). And since we are still getting resumes, Computerworld obviously has a long life cycle through its pass-along circulation,*" she adds.

"*The quality of the responses has made our ad placement more than worthwhile,*" concludes Robin. "*The professionals responding to our ad are experienced, not just job changers. We are getting in touch with just the people we need to reach.*" In fact, according to Robin, "*Quite a few of the positions are already filled. Thanks to Computerworld!*"

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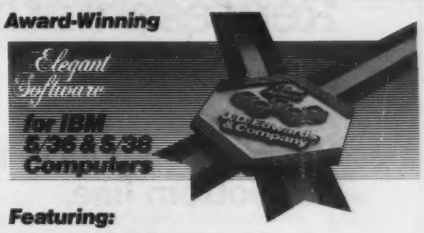

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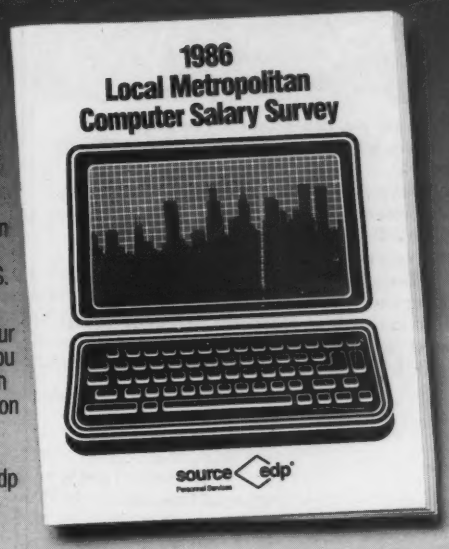

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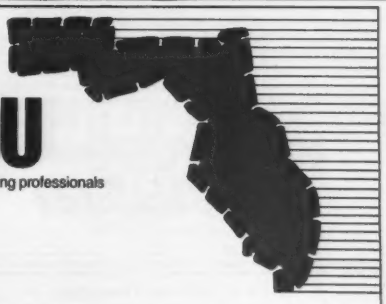

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Foreign Editorial/ Sales Offices

Argentina: Ruben Argento, Computerworld Argentina, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: 34-5583/5584. Telex: 22644.

Asia: Euan Barty, Asia Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong. Phone: (05) 8L63238. Telex: 72827 (COMWR HX)

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133, Telex: AA74752 COMWOR.

Austria: Dr. Manfred Weiss, CW Publikationen, Verlagsgesellschaft m.b.H., Josefstaedter Strasse 74, A-1080 Wein, Austria, Telex: 115 542 (sch/a).

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Denmark: Preben Engell, Computerworld/Danmark A/S, Torvegade 52, 1400 Copenhagen K, Denmark. Phone: (01) 955 695. Telex: 31566.

France: Axel LeBlois, Computerworld Communications S.A., 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, France. Phone: 747 1272. Telex: 613234 F.

Hungary: Dezso Futasz, SZT Computerworld, P.O. Box 386, Budapest, 1536, Hungary.

Italy: Daniele Comboni, Computer Publishing Group S.R.L., Viale Restelli 5, 20124 Milano. Phone: (2) 688 9773. Telex: 333436 (GEJIT).

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Taiwan: Grace Tang, ACE Media Agency Ltd., Boom 503, 1, Fu Hsin S. Road, Sec. 1, Taipei, 10587, Taiwan, R.O.C. Phone: 751 3636. Telex: 14142 (ACE GROUP). (Representative for all CWCI publications).

United Kingdom: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WCI 8UT, United Kingdom. Phone: (01) 831-9252, Telex: 262346.

Euan Rose, Bill Dunlop, Barbara Levy, Christine Taylor, Beere Hobson Assoc., 345 Goswell Rd., Islington, London EC1, United Kingdom. Phone: (01) 278 3415. Telex: 311951. (Representatives for CWCI publications).

Venezuela: Kalman von Vajna Nagy, CW Comunicaciones, C.R.L. Torre Maracaibo, Piso 10, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: 72-76-30.

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Ocean Spray MIS prepares for 1990

From page 1

ranks lean. For example, automated order processing can save several jobs at each location.

"Ocean Spray is starting to come up against the big boys now. Instead of being a sleepy little regional company, we are beginning to run into companies that, through acquisitions, have the power of companies like Coca-Cola behind them," Modestino says.

A cooperative owned by 800 cranberry and other fruit growers, Ocean Spray moved into the Fortune 500 list of industrials two years ago. Its expected 1986 revenue of $630 million is more than double its 1981 sales and keeps the company on a track toward $1 billion in revenue by 1990.

Modestino says Ocean Spray's dramatic growth began in the late 1970s and is expected to continue at a rate of about 15% in terms of both revenue and computer use for the next few years. The company's revenue growth stems from a reformulation of its original cranberry juice drink to make it tastier as well as decisions to expand Ocean Spray's product line to include blends of cranberry and other juices and noncranberry products like grapefruit juice and guava juice.

The firm has also experimented with new marketing approaches, such as the introduction of single-serving, flexible cartons with attached straws.

Planning model

The planning model was used in Ocean Spray's selection of the Model 150 over other systems from the IBM 3080 and 3090 families and shows that the Model 150 should meet the company's processing needs until late 1988, when it can be upgraded.

The planning model is represented by a loose-leaf notebook filled with color charts and graphs that Modestino can show to senior management to justify his requests for equipment. He developed the model by taking a snapshot of a typical job mix on the 3083, interviewing managers on the user side to determine their likely growth and then projecting CPU demands for each major application on a six-month basis.

Modestino made allowances for expected product introductions that could make individual applications more efficient and minimize the demand for CPU power.

Earlier this year, Modestino traveled to an IBM facility in Raleigh, N.C., to test his sample job mix on various IBM processors. The tests, using 14 hours of CPU time, showed which processors can handle his processing load and at what point each system will be overloaded. The charts show that the 3083 is at 85% of capacity now and that the Model 150 will be adequate until late 1988. Modestino also considered factors such as the cost of and upgrade possibility for each system.

One reason for acquiring the Model 150 is that Ocean Spray is reversing a policy of decentralization.

"We had an older Burroughs B1800 up through 1981. It began to bend at its knees with the number of orders the company was taking, so a second B1800 was added. It was faster but still too slow," recalls Modestino, who joined Ocean Spray as manager of financial systems development in 1981.

At the time, Ocean Spray's remote locations and processing plants — of which there now are six — were begging for processing power, according to Modestino. The company replaced the Burroughs systems with an IBM 4331 Model Group 2 in its headquarters and a series of remote Wang Laboratories, Inc. VS 80 minicomputers.

Shifted to IBM for flexibility

The shift to the IBM equipment was made because Ocean Spray wanted the flexibility to use as many third-party software packages as possible, and the volume of software written for IBM operating systems allowed that better than the amount of software written for Burroughs systems.

The minicomputers were used to process orders during the day and to batch-upload those orders to the 4331 at night. In addition, the remote minis were used for local applications, such as dealing with local government regulations, at processing plants and distribution facilities located at sites ranging from Massachusetts to Florida and Washington. A Wang VS 90 and VS 100 were installed to support the uploads and headquarters office automation.

The MIS department went through a hectic period, using as many as 10 consultants at a time for projects such as developing links between the VS 80s and the host. "We had a consulting bill that would startle you," Modestino comments. He would not disclose exact figures, however.

Just changing hardware vendors was complicated. "To a lot of people who had been here for a number of years working with the Burroughs, the move to IBM was traumatic. The Burroughs equipment was more user friendly, or at least it was easier to work with in a technical sense," Modestino adds. The move to a 4331 was followed by upgrades through the 4341 family before the 3083 was installed in 1984.

Modestino says that while decentralization was the popular philosophy industrywide in 1981, and the minicomputer-based solution worked for a time, Ocean Spray outgrew the decentralized system. He notes that it became difficult to keep a common version of an application on multiple remote systems.

Modestino adds that there are also difficulties in tracking an order when it could be on any one of three systems: the remote VS, a headquarters VS or the host. Also, maintenance can be difficult because some of the remote plants are more than 40 miles from the nearest large city.

"Two years ago, we made a decision that although decentralization made sense in 1981, we have reestablished our own credibility, and it is time to centralize again," Modestino says, noting that the remote plants were "cloning their own DP staffs" to run their minicomputers.

Ocean Spray found that its order processing system was redundant with the three levels of processing and that order processing often took 24 hours from receipt at a remote location until a shipment order was returned to that location. With centralization, the order can be processed at headquarters and printed out within minutes at the remote plant that will fill the order.

The VS 80s will be removed a year from now, although the Wang systems at headquarters will continue to support office automation while running Wang Office. Personal computers have already taken over some of the remote minis' responsibilities. IBM System/36s have been installed to act as dumb 3270 controllers and to eventually handle electronic mail at the remote locations.

Asked whether it is unusual for a company to reverse itself and return to a mainframe-intensive environment, Modestino says, "I'm not sure we are bucking a trend. As you get down into minicomputers, you have to ask yourself what you are doing with the minicomputer that you can't do with a PC. You also won't hear too many people disagree that it is better to have all of your data stored in one place. What we said was, 'Let's store it once, accurately, in one place.' "

AT A GLANCE

Ocean spray

1985 revenue: $532 million

Business: Processing cranberry sauce and cranberry and other fruit juices

Total employees: 1,800

Employees at headquarters: 380

MIS employees at headquarters: 50

Computer systems: IBM 3083 Model EX
Wang Laboratories, Inc. VS 80s, VS 90, VS 100, IBM System/36
IBM Personal Computers and compatibles

MIS director: Thomas Modestino

In connection with centralization and moving personal computers into field locations, Ocean Spray established an information center and is providing mainframe-based decision support tools to sales and logistics personnel.

In addition, the firm has installed and is modifying a manufacturing software system and is emphasizing electronic ordering, invoicing and bill payment. Within five years, electronic orders are expected to jump from 5% of all Ocean Spray orders to between 70% and 80%.

The Ocean Spray information center, established in June 1985, provides training to users and tests new technology, particularly microcomputer products. Ocean Spray has about 110 personal computers in headquarters and remote locations and has approximately 150 employees using IBM 3270 or other terminals.

Help desk for users in the field

Ocean Spray also provides a help desk, managed by its computer services department, and supports user queries from the field — queries that may come from salesmen using personal computers throughout the night and early morning.

Forty salesmen in offices across the U.S. use personal computers to access the mainframe, running Applied Data Research, Inc.'s Datacom/DB data base system, and to pull down reports about their specific product line. Those daily reports, which formerly were express-mailed to sales representatives, tell the sales force such things as whether it is meeting sales projections, how sales relate to costs and what percentage of orders have been shipped or invoiced.

Ocean Spray's principal decision support tool is Integrated Planning, Inc.'s Strategem, which sales and logistics analysts access using IBM 3270-type terminals. Modestino says Ocean Spray chose Strategem because it allows analysts to use as many dimensions as they want, rather than the two or three in personal computer-based decision support systems.

A typical use would be to examine the respective costs of shipping products from alternative sites when a single plant is low on inventory. Modestino adds that a key feature of Strategem, which he says can be hard to learn, is its ability to support at least limited Cobol input.

"Strategem really was a gamble, because we in MIS have a general tendency to overlook learning curves. You can never be sure that the users will take the time needed to learn how to use a product. It didn't progress as fast as I thought, but two years later, we still are where we wanted to be," Modestino says, noting that Strategem is one reason Ocean Spray cut out the need for service bureaus performing statistical market research.

Other third-party packages running on the IBM equipment include several McCormack & Dodge Corp. accounting systems, Comserve Corp.'s Amaps manufacturing software and Datacom DB.

To illustrate how fast Ocean Spray's MIS operation has grown, Modestino notes that his staff is doing a major modification to Amaps to make it better support the food processing industry, rather than the discrete manufacturing for which most manufacturing software is designed. Ocean Spray bought all six Amaps modules and is using most of them for tasks such as purchasing, inventory control and material requirements planning.

The modification effort is focused on the shop floor module. Unlike manufacturing operations that involve dozens of steps, Ocean Spray's processing is basically a two- or three-step operation as cranberries are pressed and preserved.

Modestino notes that most shop floor management systems are designed to reduce paper, such as work orders, which is not a major concern in processing. He says the Amaps modification is a larger project than the entire 1981 conversion that required so much outside assistance. He adds that this project is being done in-house.

But that is not Modestino's biggest project today. Now he is planning for a corporate relocation. Two years from now, Ocean Spray will be leaving its Plymouth headquarters for a larger building in nearby Middleboro, Mass. The new building will not have the harbor view, but it will overlook acre after acre of raw inventory — cranberry bogs.

Asher Technologies to be sold

By James A. Martin

NORCROSS, Ga. — In a move to increase the stock market value of the company, Intelligent Systems Corp. is expected to spin off its Asher Technologies, Inc. communications product division and to sell some 40% of its profitable Princeton Graphic Systems, Inc. in a public offering.

Intelligent Systems, the parent company of Quadram Corp., Peachtree Software, Inc. and other computer enhancement divisions, is "interested in redeploying assets in order to maximize shareholder value," said J. Leland Strange, Intelligent Systems president and chief executive officer.

The firm confirmed reports last week that Asher Technologies would be sold to a California-based investor group, but did not reveal the group's identity.

Asher Technologies has operated as a stand-alone company since it was acquired in February 1985 by Intelligent Systems.

Several analysts agreed that Princeton Graphic Systems, also a stand-alone Intelligent Systems company based in Princeton, N.J., would make a public offering sometime in the early fall. Neither Intelligent System's Strange nor Princeton Graphic's President C.T. Wu would confirm those reports.

Datapoint reports fiscal-year loss but improves from last year's deficit

SAN ANTONIO — Datapoint Corp. last week reported fourth-quarter net earnings of $231,000, or 1 cent per share, compared with a deficit of $5.8 million posted in the like period last year. Taking into consideration the spin-off of its Intelogic Trace, Inc. service unit, Datapoint's fourth-quarter loss last year was $13.6 million on an unaudited basis, according to the firm.

Revenue for the quarter ended July 26 was $89 million, off 20% from the same period last year. Excluding Intelogic Trace, last year's fourth-quarter revenue was $87.7 million, the firm noted.

For the fiscal year, Datapoint reported a net loss of $8.5 million, a significant improvement from the $48.2 million deficit it posted last year. Taking into account the Intelogic Trace spin-off, the deficit was $84.5 million for fiscal 1985. Fiscal 1986 revenue declined by 37% from last year to $325 million.

Alpha Micro dispute ends

From page 146

Through the merger, both companies should be able to reduce overhead in such areas as research and development and sales expenses, Navarro continued. Alpha Micro's 450 value-added resellers will help Televideo broaden its sales presence, he added.

In the current quarter, ending in November, Alpha Micro should break even, with Televideo losing about $500,000, Navarro predicted. In its last fiscal year, which ended Feb. 23, Alpha Micro lost $3.5 million on revenue of $48.2 million.

Point 4 Data had offered to purchase up to 49.9% of Alpha Micro shares at $6 per share.

Point 4 Data also proposed to later buy the remaining shares with subordinated three-year notes representing $5.50 per share and 8% interest per annum.

Calling his company's offer "fair and appropriate," Point 4 Data President William Rigby said his company would look for other merger and acquisition candidates.

The proxy fight had been initiated by Richard Wilcox and Robert Hitchcock, who together own more than 25% of Alpha Micro's stock. Wilcox and Hitchcock were ousted late last month as chairman and vice-chairman, respectively.

President Richard Cortese replaced Wilcox as chairman, and the title of vice-chairman was eliminated.

Tracking inside trade trends insufficient without analysis

ACTIVE ISSUES
Kathy Porteus

Correctly anticipating changes in the value of a company's stock is key to successful investing. Some investors claim they can better detect such changes by monitoring the investment activity within a company's executive suite.

"Insider trading" is the term generally associated with the buying and selling of company's stock by that company's officers, directors and shareholders with at least 10% equity.

Insider trading should not be confused with trading securities on material, nonpublic or "inside" information, which is illegal.

SEC requirements

The Securities and Exchange Commission (SEC) requires insiders to report any change in their direct or indirect holdings of their company's outstanding stock no later than the 10th day of the month following the month in which they bought or sold stock.

To protect the interests of outside investors, the SEC's short swing profits rule stipulates that insiders cannot sell stock within six months of acquiring it without returning the profit to the company. For this reason, insiders often act early in anticipating stock price movements.

Tracking insider activity has become popular among outsiders because insiders have historically outperformed the market with regard to their company's stock.

Several publications and on-line services monitor and evaluate insider activity as it is reported to the SEC. For example, *Vickers Weekly Insider Report* rates companies on several criteria to determine levels of insider activity. Positive and negative ratings refer to purchases and sales, respectively.

"There are thousands of reasons for an insider to sell, but only one reason to buy," says Edwin Buck, editor of *Vickers*. "That is, belief in the company." Recently, Buck studied a group of down-and-out companies, several in high technology, that showed a positive insider rating for 1985. According to Buck, in 1986 this group of stocks moved higher than the Dow Jones industrial average.

In assessing insider sales, one must separate the trivial trade from the investment decision. Selling stock to buy a house or pay off a debt constitutes trivial selling, according to Buck. How does an investor gauge the significance of insider sales activity?

Buck suggests checking the percentage of holdings the insider sells, whether the insider sells when the stock market is rising or buys in a falling market, whether all of the corporate officers are unanimous on the buy or sell side and whether insiders are reversing themselves by selling soon after buying. "These factors pinpoint insider investment decisions in any particular stock," Buck says.

Average insider activity

According to Buck, technology companies always have insider sales activity. Therefore, one must know the company and what the average insider activity is for the company.

For example, Buck reported a higher than usual level of insider selling at IBM prior to its disappointing second-quarter earnings disclosure.

But insider selling at Digital Equipment Corp., which received a rating of negative 141 two weeks ago when the Vickers index average was negative 8.66, reflects insiders taking profits rather than taking precautions.

Despite his belief in the correlation of insider investment decisions and stock price movements, Buck insists that monitoring insider trading should be used by the investment community as a flag for further study, not as the sole reason for investing in a specific stock.

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

IBM staff trims one step to health

From page 146

use of supplemental employees and reduced discretionary expenses, the voluntary retirement plan should help IBM reduce costs at a time when it is facing the prospect of a second consecutive year of lower earnings.

Even if its employment reduction efforts are successful, IBM can avert an earnings slide this year only if demand, particularly for mainframes, picks up dramatically in the fourth quarter, analysts say.

"Demand in the third quarter was better than in the second quarter, but only by a smidgen," says William Easterbrook, an analyst with Kidder, Peabody & Co. in San Francisco.

IBM, which employed 242,241 people at the end of 1985, said normal attrition and limited hiring would lower its work force by approximately 4,000 employees this year. Between normal attrition, limited hiring and early retirement incentives, the company expects to reduce its work force by another 8,000 next year.

Fred Cohen, who tracks IBM for L. F. Rothschild, Unterberg Towbin in New York, figures that IBM's employment reduction efforts could save almost $500 million for the company between this year and next.

"It's between 8,000 and 10,000 people, and if you take that at a fully loaded cost of between $50,000 and $70,000, you're talking of saving about half a billion dollars," Cohen says.

Cohen does not expect IBM to take measures that would further cut its work force. "Within the confines of a full-employment strategy, they've gone as far as they can go," he says.

Other analysts say they believe IBM has not gone far enough.

Ulric Weil, a Washington, D.C.-based analyst, says that if an early retirement program is the extent of IBM's cost-cutting measures, the firm will be unable to substantially reduce its expenses. Asked what else IBM could do, Weil suggested the firm take a look at its accrued vacation plan, for starters.

"IBM could do what other companies have done with vacation time," he says. "It should say, 'If you don't use the time, you lose it.' "

Easterbrook of Kidder, Peabody says that further cost-cutting actions are desperately needed. "There's no way a multibillion dollar company can continue to expect historical growth rates of 15%," he says. "Anyone that does should have his head examined."

With older IBM employees taking advantage of early retirement incentives, IBM could find itself with a limited amount of good middle and top management, adds Donald Haback, an independent analyst based in Great Neck, N.Y.

COMPUTER INDUSTRY

MITCHELL J. HAYES

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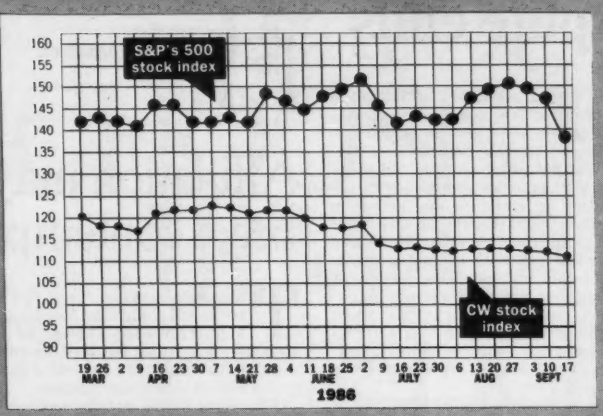
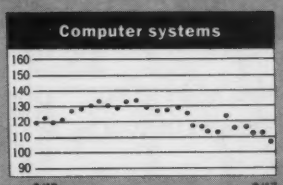
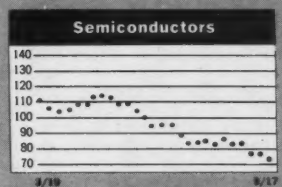
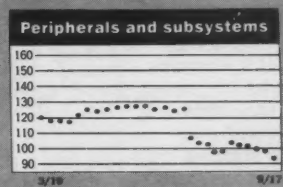
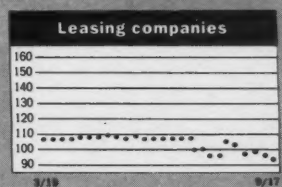
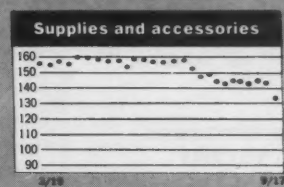












All indexes reflect a historical base of 100 on Dec. 31, 1984, and trace stock market performance in relation to that base. The CW stock index represents the unweighted average performance of the six categories of computer industry stocks.

	9/10/86	9/17/86
Computer systems	113.8	**108.6**
Software and DP services	98.6	**91.9**
Peripherals and subsystems	99.3	**94.0**
Supplies and accessories	142.7	**133.7**
Semiconductors	78.4	**73.9**
Leasing companies	95.4	**93.3**
CW stock index	112.3	**111.3**
Standard and Poor's 500 stock index	147.7	**138.5**

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 17, 1986

COMPUTER SYSTEMS

E X C H		PRICE 52-WEEK RANGE (1)		CLOSE SEPT. 17 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	8	4	6.63	+0.8	+12.8
O	ALTOS COMPUTER SYS	19	10	11.38	-1.3	-9.9
A	AMDAHL CORP	21	10	19.00	-1.1	-5.6
O	APOLLO COMPUTER INC	18	9	11.38	-0.6	-5.2
O	APPLE COMPUTER INC	39	15	34.25	-0.8	-2.1
N	AT&T	26	20	23.13	-1.9	-7.5
N	BURROUGHS CORP	76	52	69.25	-1.1	-1.6
O	C P T CORP	7	4	4.00	-0.3	-5.9
N	COMPAQ COMPUTER CORP	18	8	14.75	-0.4	-2.5
A	COMPUTER CONSOLES INC	12	6	7.38	-0.9	-10.6
O	CONCURRENT COMP CORP	25	1	13.88	+0.0	+0.0
N	CONTROL DATA CORP DEL	29	15	27.38	+1.3	+4.8
O	CONVERGENT TECH	14	6	6.00	-0.6	-9.4
N	CRAY RESH INC	100	45	83.50	-3.8	-4.3
O	DAISY SYS CORP	32	8	8.88	-0.3	-2.7
N	DATA GEN CORP	50	30	32.50	-3.3	-9.1
N	DATAPOINT CORP	9	5	7.63	-1.1	-12.9
N	DIGITAL EQUIP CORP	105	51	95.13	-4.4	-4.4
N	ELECTRONIC ASSOC INC	7	4	4.00	-0.4	-8.6
N	FLOATING POINT SYS INC	46	12	13.13	+0.1	+1.0
N	GOULD INC	38	15	18.13	-1.8	-8.8
N	HARRIS CORP DEL	36	22	28.25	-1.9	-6.2
N	HEWLETT PACKARD CO	50	29	45.75	-1.8	-3.7
N	HONEYWELL INC	87	59	78.50	+9.0	+12.9
N	IBM	162	122	137.63	-6.5	-4.5
O	IPL SYS INC	4	1	2.50	-0.3	-9.1
N	ITT CORP	60	32	49.00	-3.5	-6.7
N	M A COM INC	19	13	13.63	-1.5	-9.9
N	MATSUSHITA ELEC INDL LTD	110	49	101.00	-7.8	-7.1
O	MENTOR GRAPHICS CORP	21	11	14.38	+0.4	+2.7
O	MOHAWK DATA SCI CORP	4	1	2.50	-0.6	-20.0
N	NBI INC	16	9	9.75	-0.4	-3.7
N	NCR CORP	57	31	50.38	-4.8	-8.6
N	PRIME COMPUTER INC	28	15	20.38	-1.3	-5.8
N	SPERRY CORP	77	46	75.75	-1.0	-1.3
O	STRATUS COMPUTER	26	15	21.00	-0.8	-3.4
O	SYMBOLICS INC	16	6	5.88	-1.1	-16.1
O	TANDEM COMPUTERS INC	40	13	34.50	-1.0	-2.8
N	TANDY CORP	45	31	32.13	-1.9	-5.5
N	TEXAS INSTRS INC	148	88	114.25	-5.5	-4.6
A	ULTIMATE CORP	35	11	17.25	+1.6	+10.4
A	WANG LABS INC - B	23	12	13.75	-1.0	-6.8
A	WANG LABS INC - C	23	11	13.88	-0.5	-3.5
N	XEROX CORP	72	46	52.88	-3.9	-6.8

SUPPLIES & ACCESSORIES

N	AMER BUSINESS PRODS	37	25	27.25	-1.4	-4.8
N	BARRY WRIGHT CORP	25	16	16.50	-1.1	-6.4
A	DUPLEX PRODS INC	23	17	20.00	-0.4	-1.8
N	ENNIS BUSINESS FORMS INC	28	15	22.25	-2.1	-8.7
N	3M CO	116	74	103.75	-10.6	-9.3
N	MOORE LTD	28	18	22.00	-0.5	-2.2
O	STANDARD REGISTER CO	50	31	34.25	-3.8	-9.9
N	WALLACE COMPUTER SVCS	50	33	36.38	-3.1	-7.4

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON; L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER; S=SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID

(1) TO NEAREST DOLLAR

SOFTWARE & DP SERVICES

E X C H		PRICE 52-WEEK RANGE (1)		CLOSE SEPT. 17 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	7	3	4.75	-0.3	-5.0
N	ADVANCED SYS INC	20	12	14.25	-1.4	-8.8
N	AGS COMPUTERS INC	25	14	17.38	-1.3	-6.7
O	AMERICAN MGMT SYS INC	20	8	14.50	-1.5	-9.4
O	AMERICAN SOFTWARE INC	15	9	12.88	+0.3	+2.0
N	ANACOMP INC	7	3	3.00	-0.3	-7.7
O	ANALYSTS INTL CORP	10	4	4.00	-0.5	-11.1
O	ASHTON TATE	34	10	27.13	-1.5	-5.2
O	ASK COMPUTER SYS INC	15	7	10.63	-1.1	-9.6
O	ASTRADYNE COMP IND	3	1	2.19	-0.2	-9.1
N	AUTOMATIC DATA PROC	39	18	30.50	-3.5	-10.3
O	COMPUTER ASSOC INTL INC	25	10	22.75	-0.8	-3.2
O	COMPUTER HORIZONS CORP	15	10	10.25	-0.4	-3.5
O	COMPUTER NETWORK TECH	10	2	5.44	+0.0	+0.0
N	COMPUTER SCIENCES CORP	40	22	32.13	-4.0	-11.1
O	COMPUTER TASK GROUP INC	19	11	11.50	+0.0	+0.0
O	COMPUTONE SYS INC	6	1	1.00	-0.3	-20.0
O	COMSHARE INC	16	9	11.63	-3.1	-21.2
N	CULLINET SOFTWARE INC	20	6	7.50	-0.5	-6.3
O	CYCARE SYS INC	17	10	10.75	-0.8	-6.5
O	DUQUESNE SYS INC	33	11	25.25	-4.0	-13.7
N	GENERAL ELEC CO	83	56	72.38	-5.4	-6.9
N	GENERAL MTRS CORP	50	33	34.63	-1.8	-4.8
N	GTE CORP	60	38	53.00	-4.3	-7.4
O	HOGAN SYS INC	12	5	8.88	-1.1	-11.3
O	INFORMATION SCIENCES INC	4	1	1.50	+0.0	+0.0
O	INFOTRON SYS CORP	20	10	9.50	-1.5	-13.6
O	KEANE INC	16	7	7.00	-0.5	-6.7
N	LOGICON INC	43	26	27.25	-1.1	-4.0
O	LOTUS DEV CORP	42	15	36.25	-2.3	-5.8
O	MANAGEMENT SCI AMER	16	8	12.75	-1.0	-7.3
O	MCI COMM CORP	13	7	7.38	-0.8	-9.2
O	MICOM SYS INC	23	10	11.00	-1.3	-10.2
O	MICRO PRO INTL CORP	4	2	2.13	-0.3	-10.5
O	MICROSOFT CORP	36	26	29.50	-0.8	-2.5
O	NATIONAL DATA CORP	26	12	17.38	-1.8	-9.2
O	ON LINE SOFTWARE INT	16	6	10.25	-1.0	-8.9
O	ORACLE SYS CORP	29	13	15.50	+0.3	+1.6
N	PANSOPHIC SYS INC	36	18	29.00	-0.6	-2.1
N	PLANNING RESH CORP	24	14	21.25	-0.9	-4.0
O	POLICY MGMT SYS CORP	24	15	16.75	-0.5	-2.9
O	PROGRAMMING & SYS INC	11	5	8.31	+0.3	+3.9
O	REYNOLDS & REYNOLDS CO	42	18	33.25	-3.3	-8.9
O	SCIENTIFIC COMPUTERS INC	6	4	4.38	-0.1	-2.8
O	SEI CORP	28	15	16.50	-2.5	-13.2
O	SHARED MED SYS CORP	41	29	32.50	-2.0	-5.8
O	SOFTWARE AG SYSTEMS INC	22	13	17.13	-1.5	-8.1
O	SOFTWARE PUBG CORP	10	5	5.25	+0.0	+0.0
A	STERLING SOFTWARE INC	21	7	14.00	-3.1	-18.2
N	UCCEL CORP	24	13	20.88	-2.8	-11.6
N	URS CORP	18	10	14.75	-0.5	-3.3
O	VM SOFTWARE INC	32	17	27.25	+0.8	+2.8

SEMICONDUCTORS

N	ADVANCED MICRO DEV	34	14	17.38	-1.5	-7.9
N	ANALOG DEVICES INC	25	14	17.00	-1.1	-6.2
N	ANALOGIC CORP	16	10	11.63	-1.0	-7.9
N	APPLIED MAGNETICS CORP	20	12	13.00	-1.3	-8.8
O	AVANTEK INC	24	15	15.88	-0.3	-1.6
O	HADCO CORP	7	3	3.88	+0.5	+14.8
O	INTEL CORP	32	16	20.50	-1.3	-5.7
O	MICRO MASK INC	7	2	2.88	-0.4	-11.5
N	MOTOROLA INC	50	29	41.50	-1.8	-4.0
N	NATIONAL SEMICONDUCTOR	16	9	9.13	-1.1	-11.0
N	TERADYNE INC	30	17	18.00	-2.8	-13.3

PERIPHERALS & SUBSYSTEMS

A	AM INTL INC	9	3	5.13	-1.0	-16.3
A	ANDERSON JACOBSON INC	3	2	1.75	-0.1	-6.7
O	AST RESH INC	33	11	10.88	-1.4	-11.2
O	AUTOTROL CORP	10	6	6.69	+0.1	+1.0
O	AVANT GRADE COMPUTING	9	3	3.00	-0.4	-11.1
O	BANCTEC INC	13	6	7.25	+0.3	+3.6
N	BOLT BERANEK & NEWMAN	48	29	37.25	-5.8	-13.4
N	CENTRONICS DATA COMP	8	4	6.63	-0.8	-10.2
A	CETEC CORP	9	6	6.00	+0.1	+2.1
A	COGNITRONICS CORP	6	3	2.50	-0.1	-4.8
N	COMPUGRAPHIC CORP	29	16	19.25	+2.6	+15.8
N	COMPUTERVISION CORP	19	9	13.13	-0.8	-5.4
N	CONRAC CORP	18	11	15.13	-0.4	-2.4
A	DATAPRODUCTS CORP	18	11	13.50	-1.5	-10.0
A	DATARAM CORP	18	5	8.00	-0.6	-7.2
O	DATA SWITCH CORP	9	5	5.88	-0.3	-4.1
O	DATUM INC	7	5	5.13	+0.0	+0.0
N	DECISION INDS CORP	15	8	8.50	-0.9	-9.3
O	ENDATA INC	8	3	5.38	+0.0	+0.0
O	EVANS & SUTHERLAND	27	17	20.88	-1.9	-8.2
N	FLOATING POINT SYS INC	46	12	13.13	+0.1	+1.0
O	GANDALF TECHNOLOGIES	8	5	5.41	-0.5	-8.0
N	GENERAL DATACOMM IND	15	8	8.88	-0.5	-5.3
N	HAZELTINE CORP	27	16	18.00	-0.3	-1.4
O	ICOT CORP	13	6	9.00	-1.3	-12.2
O	INFORMATION INTL INC	18	10	14.00	-1.3	-8.2
O	INTECOM INC	7	3	5.31	+0.0	+0.0
O	INTERLEAF INC	15	8	8.50	+0.5	+6.3
O	MEGADATA CORP	5	2	2.38	-0.4	-13.6
A	MSI DATA CORP	14	8	9.88	-0.6	-6.0
N	NASHUA CORP	28	12	21.00	-2.1	-9.2
O	NETWORK SYS CORP	26	10	13.50	-0.6	-4.4
N	NORTH AMERN PHILIPS CORP	48	32	38.75	+1.3	+3.3
N	NORTHERN TELECOM LTD	38	25	28.25	-1.8	-5.8
O	NOVELL INC	24	10	19.50	-3.0	-13.3
O	OMEX	1	0	0.38	+0.0	+0.0
N	PARADYNE CORP	11	5	5.00	-1.0	-16.7
A	PENRIL CORP	9	5	5.13	+0.0	+0.0
N	PLESSEY PLC	38	19	27.00	-0.8	-2.7
O	PRINTRONIX INC	15	11	13.25	-0.3	-1.9
O	QMS INC	16	6	12.00	-0.5	-4.0
O	RAMTEK CORP	7	2	4.75	-0.8	-13.6
N	RECOGNITION EQUIP INC	17	9	12.38	-1.1	-8.3
N	SANDERS ASSOC INC	63	29	59.88	+0.0	+0.0
O	SCAN TRON CORP	24	12	16.25	-1.3	-7.1
N	SCIENTIFIC ATLANTA INC	15	9	8.88	-1.0	-10.1
O	SEAGATE TECHNOLOGY	15	5	13.50	-1.1	-7.7
N	STORAGE TECHNOLOGY	7	1	2.25	-0.3	-10.0
O	SUN MICROSYSTEM INC	20	11	13.75	-0.9	-6.0
A	T-BAR INC	7	5	5.13	-0.6	-10.9
A	TAB PRODS CO	15	10	13.75	-1.0	-6.8
O	TANDON CORP	8	3	2.94	-0.1	-2.1
A	TEC INC	9	4	4.88	-0.4	-7.1
N	TEKTRONIX INC	65	47	59.75	-2.4	-3.8
O	TELEVIDEO SYS INC	4	2	2.88	+0.0	+0.0
N	TELEX CORP	69	42	58.63	+0.9	+1.5
N	TIMEPLEX INC	24	14	15.25	+0.3	+1.7
N	TITAN CORP	12	5	7.88	-0.6	-7.4
O	VISUAL TECHNOLOGY INC	1	0	0.69	-0.1	-15.4
O	WYSE TECH	19	7	13.38	-0.5	-3.6

LEASING COMPANIES

N	COMDISCO INC	25	12	17.63	-0.6	-3.4
N	CONTINENTAL INFO SYS	12	5	8.75	-0.5	-5.4
O	FINALCO GROUP INC	5	3	3.44	+0.0	+0.0
O	PHOENIX AMERN INC	6	2	3.75	+0.0	+0.0
O	SELECTERM INC	12	5	6.13	+0.1	+2.1
N	U.S. LEASING	46	32	41.00	-3.0	-6.8

COMPUTER INDUSTRY

INSIDE

Tarkenton Software teams up with Knowledgeware to automate software development/**118**

Paradyne is under investigation by the U.S. Customs Service for possible noncompliance with overseas shipping regulations/**125**

CDC prepares to sell its Commercial Credit subsidiary/**128**

INSTANT ANALYSIS

"No one has been spared from the effects of consolidation in the computer industry. Investors, analysts, industry executives and journalists have all paid their dues in a very strange way."

— Bob Grandhi, analyst at Interstate Securities Corp.

Alpha Micro dispute ends

Televideo's $25.6M offer accepted, Point 4 concedes

By David Bright

SUNNYVALE, Calif. — Televideo Systems, Inc. last week agreed to acquire supermicrocomputer vendor Alpha Microsystems, Inc. for approximately $25.6 million in cash and stock. The agreement comes on the heels of a tender offer by Point 4 Data Corp. and a proxy battle launched by two Alpha Micro cofounders for control of the financially troubled company [CW, Sept. 8].

Under the proposed acquisition, Televideo will buy all outstanding Alpha Micro shares for $8 each, with half of those shares being paid for in cash and half in Televideo stock.

A vote by Alpha Micro's shareholders is expected to take place either at the firm's Dec. 9 shareholder meeting or by proxy, a company spokesman said. If the acquisition is approved, Alpha Micro will become a wholly owned subsidiary of Televideo, which manufactures terminals and personal computers. Both companies' management teams will remain intact.

"For the past nine months, Televideo has been looking for an appropriate corporate partner to assist in our long-term growth plans," said Howard Oringer, chief operating officer at Televideo. "We believe that Alpha Micro, with its strong dealer base and technical capabilities, is ideal for Televideo's first major acquisition."

Analysts suggested that Alpha Micro would benefit from Televideo's greater financial resources, ability to supply terminals for its multiuser systems and offshore manufacturing capacity.

Despite suffering a loss of $700,000 on third-quarter sales of $25 million, Televideo is "flooded with cash," said Samuel Navarro, an analyst with Ladenburg, Thalmann & Co. in New York. With times getting even tougher for vertical market companies like Alpha Micro, Televideo's capital should be a big help, Navarro said.

See **ALPHA** page 144

IBM staff trimming just one step toward health, analysts say

By Alan Alper

NEW YORK — IBM's recently invoked voluntary retirement program is a small and somewhat belated step in the bloated corporation's attempt to significantly trim expenses during the two-year-long computer industry slump, analysts said last week.

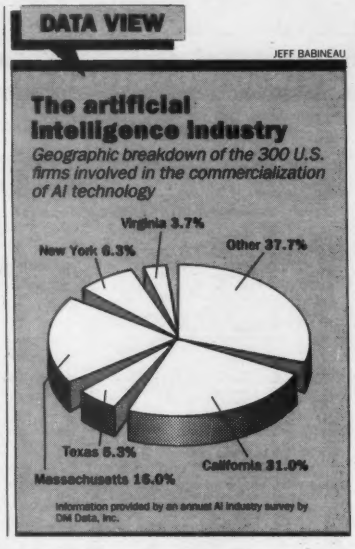
The plan, which allows employees as of Dec. 15 of this year to retire at 55 — five years earlier than before — does preserve IBM's much-ballyhooed full-employment tradition. "IBM is like an insurance policy," says Louis Giglio, a market research analyst at Bear, Stearns & Co. in New York. "You sign on, and you're in for life."

Combined with the limited hiring program instituted earlier this year, curtailed

See **IBM** page 144

DATA VIEW

JEFF BABINEAU



INDUSTRY INSIGHT
Alan Alper

Affiliation may beget contempt

There were many an "I told you so" heard around the brokerage industry recently when AT&T and Quotron Systems, Inc. terminated their 15-month-old joint marketing and product development arrangement.

Whispered within certain sectors of Wall Street is the rumor that the breakup is the initial move in what will be a massive backlash against Quotron following its acquisition by Citicorp for $680 million last June.

Such knee-jerk responses are understandable, considering the competitive nature of the financial services field. As Citibank diversifies its portfolio of financial services, it is locking horns with many old-line Wall Street firms. The brokerage brethren don't seem to like it much.

On one hand, it seems that the ruptured relationship does not bode well for Quotron. AT&T reconsidered its participation in the venture after the first prospect, Shearson Lehman Brothers, Inc. said it was wary of purchasing financial information services from a subsidiary of archrival Citicorp.

Shearson, from AT&T's perspective, put a damper on the venture's prospects by withdrawing its commitment for between $150 million and $200 million worth of products and services during a period of five years.

The decision for Shearson was easy. Brokerage houses today have a plethora of financial information service vendors to choose from. They no longer feel inextricably tied to Quotron.

With its 80,000 terminal installa-

See **AFFILIATION** page 126

Alper is Computerworld*'s mid-Atlantic bureau correspondent.*

NCR cautiously optimistic about prospects in face of slump

Slow domestic mart, tax law could hinder results

By Alan Alper

NEW YORK — Citing encouraging order rate trends following a strong first-half performance, NCR Corp. chairman Charles Exley last week said he remains cautiously optimistic about the firm's prospects despite the lingering effects of the prolonged industry downturn.

Speaking for the first time in three years to members of the New York Society of Security Analysts, Exley called the current slowdown "a passing phenomenon," but he emphasized that NCR had yet to see signs of an upturn.

"My caution comes from what I see happening in the U.S.," he said. "Sales of semiconductors to the computer industry dropped dramatically in the July/August time period."

NCR's Exley

Exley acknowledged that his earlier projection of a mediocre first half being followed by a significant improvement in market conditions in the second half did not materialize.

"At the time, I predicted that 1986 would be another year of progress for NCR in revenue and earnings," Exley said. "We still expect this, but I must say now that current market conditions make it look a lot tougher now than it did in January."

Pointing to a variety of financial barometers, Exley contended that despite the industry slump, NCR continues to outperform the majority of its competitors.

For instance, in the first half of the year, NCR's revenue rose by almost 14% to $2.12 billion, Exley noted. Revenue increases at 11 of the firm's major competitors averaged 8%, he added.

Analysts were upbeat concerning NCR's recent showing and its prospects. "It shows you that good management can prevail and withstand a general computer industry slowdown," said Ulric Weil, a Washington D.C.-based analyst.

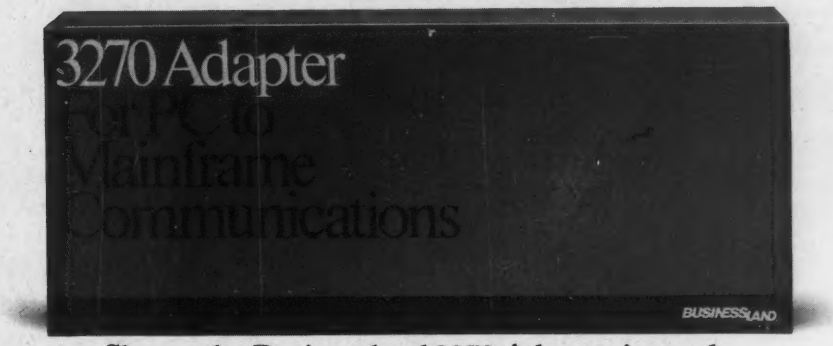
Exley said he continues to worry about reduced domestic gross margins and the impact of the proposed federal tax code overhaul that would increase corporate income tax and eliminate some research and development benefits.

Exley also acknowledged for the first time that NCR had considered acquiring Sperry Corp. prior to Burroughs Corp.'s proposed takeover.

"We were in discussions with Sperry when Burroughs made its $70-a-share offer and knocked us out of the picture," Exley recalled. "It was clear that Sperry was worth more to Burroughs than to us."

See **NCR** page 125

IF YOU CAN'T CHOOSE BETWEEN IRMA AND IBM, DON'T.



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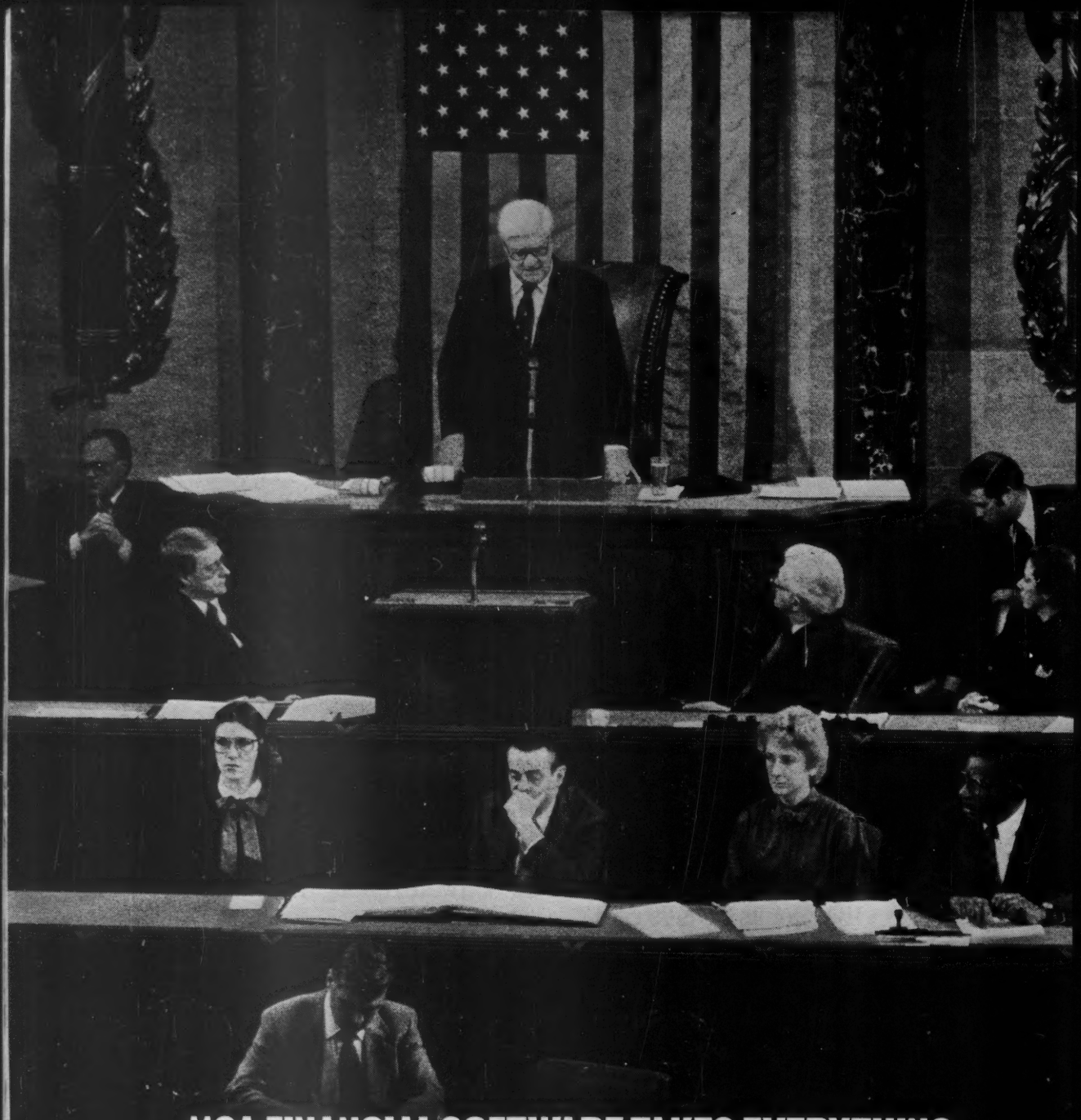

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